CONTROL COMPONENTS

From Your Local Stocking Distributor...

PENSTOCK™ INC
RF/MICROWAVE DISTRIBUTION

California, Northern
Sunnyvale 408-730-0300
California, Southern
714-758-8868
805-650-8400
818-841-8881
Westwood 310-208-2877
San Diego 619-225-8600
Colorado
Denver 303-421-7161
Florida
Palm Bay 800-522-2012
Georgia
Atlanta 404-951-0300
Illinois
Palatine 708-934-3700
Indiana
Indianapolis 317-784-3870
Kansas
Olathe 913-829-9330

Massachusetts
Marlborough 508-624-7300
New Jersey
Fairfield 201-808-1414
New York
E. Northport 516-368-2773
Pennsylvania
Coatesville 215-383-9536
Texas
Dallas 214-701-9555
Washington
Bellevue 206-454-2371

Canada
British Columbia
Vancouver 604-662-3475

M/A-COM
CONTROL COMPONENTS DIVISION

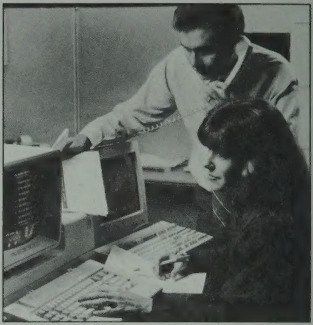
M/A-COM Control Components Division

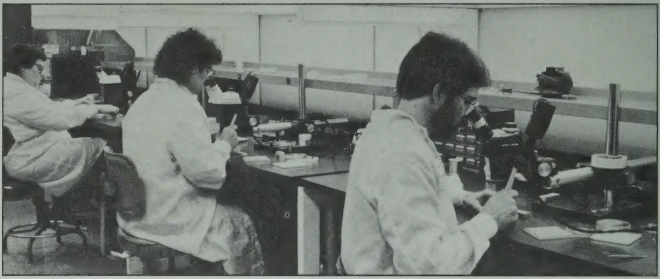
The Industry's Broadest Line

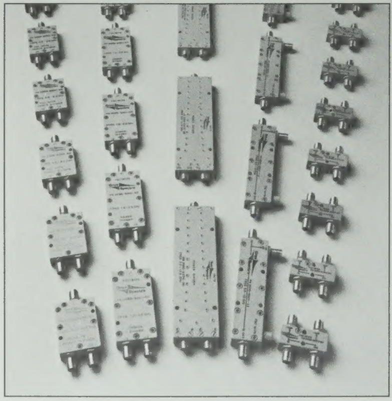
M/A-COM offers the industry's broadest selection of microwave components available as standard catalog items. Consistent with a commitment to maintain leadership in delivering the highest quality products at excellent prices, production facilities and inventories have been greatly increased.

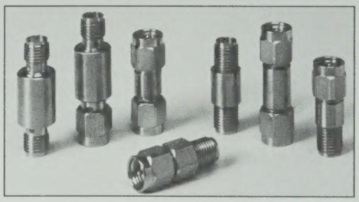
This catalog indicates the wide variety of passive and solid state components available through your locally Authorized M/A-COM Stocking Distributor.

For immediate assistance with any component in this catalog, contact your Authorized Distributor or the factory directly. A reply card has been incorporated into this catalog to assist you in requesting information and additional literature directly from the factory.





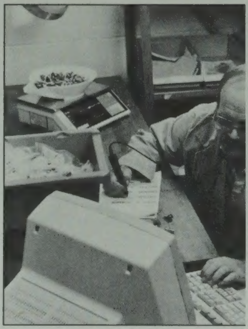




For more information
on these and other
M/A-COM products, use
the postage paid reply
card at the back of
this catalog.

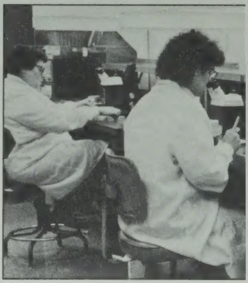
M/A-COM Control Components Division

The Industry's Broadest Line

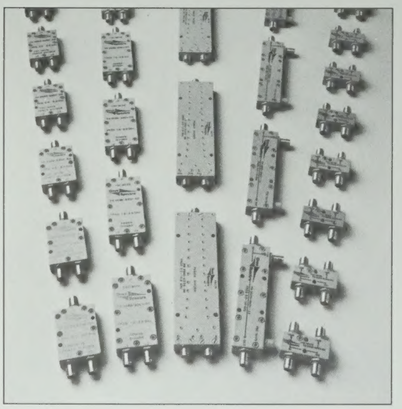


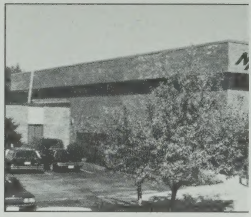
M/A-COM offers the industry's broadest selection of microwave components available as standard catalog items. Consistent with a commitment to maintain leadership in delivering the highest quality products at excellent prices, production facilities and inventories have been greatly increased.

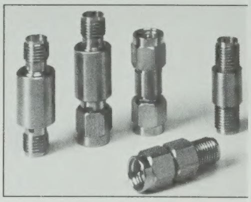
This catalog indicates the wide variety of passive and solid state components available through your locally Authorized M/A-COM Stocking Distributor.



For immediate assistance with any component in this catalog, contact your Authorized Distributor or the factory directly. A reply card has been incorporated into this catalog to assist you in requesting information and additional literature directly from the factory.







Capabilities and Facilities 2

PASSIVE COMPONENTS

Fixed Coaxial Attenuators 4
Fixed Coaxial Terminations 13
Couplers 25
Power Dividers 30
Detectors 38
Coaxial Components 43
Waveguide Adapters 48

SOLID STATE COMPONENTS

Switches and Switch Drivers 50
Limiters 59
Mixers 63
Part Number Index 66

Specifications

Specifications may change or products may be discontinued at M/A-COM Control Components Division's discretion without prior notice.

Warranty

M/A-COM Control Components Division warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If within one year after delivery to the original owner and after prepaid return by the original owner, any M/A-COM Control Components Division product is found to be defective, M/A-COM Control Components Division shall, at its option, repair or replace said defective unit. This warranty does not apply to products which have been disassembled, modified or subjected to conditions exceeding the applicable specifications or ratings. M/A-COM Control Components Division reserves the right to make design changes without notice on any of its products without any obligation to make the same or similar changes to units previously purchased. In no event does M/A-COM Control Components Division assume liability for installation labor or for consequential damages. This warranty is the extent of the obligation or liability assumed by M/A-COM Control Components Division with respect to its products, and no other warranty or guarantee is either expressed or implied.

OSM and OSSM are registered trademarks of M/A-COM Omni Spectra, Inc
OSP is a trademark of M/A-COM Omni Spectra, Inc.

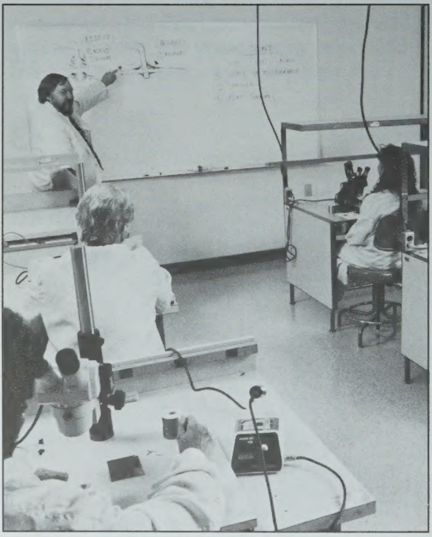
Capabilities & Facilities

M/A-COM's Control Components Division has been a leading manufacturer of microwave components for nearly three decades.

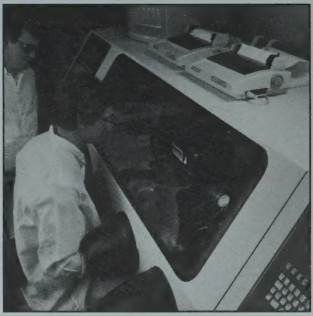
Our commitment to quality is evident in every product and service we provide. Our engineering staff enjoys worldwide recognition as leaders in technological innovation.

Our commitment to excellence as a manufacturer is reflected in our modern state-of-the art facility and our highly skilled, specialized workforce.

M/A-COM's Control Components are marketed worldwide through a comprehensive network of Authorized Stocking Distributors as well as M/A-COM Field Sales offices and representatives.



Continual skills training is part of our Total Quality Commitment (TQC)



Parallel resistance seam welder in dry nitrogen glove box

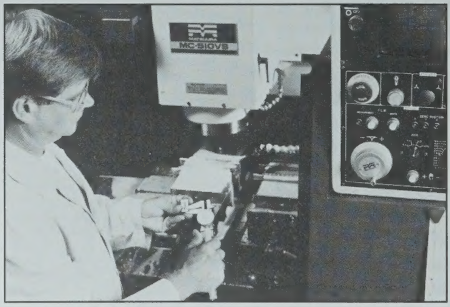
Assembly areas within Class 100,000 Clean Rooms conforming to Federal Standard 209

Capabilities and Facilities

Specialized RF and microwave components, covering a wide variety of applications are developed by a fully staffed engineering department supported by the latest automated design equipment.

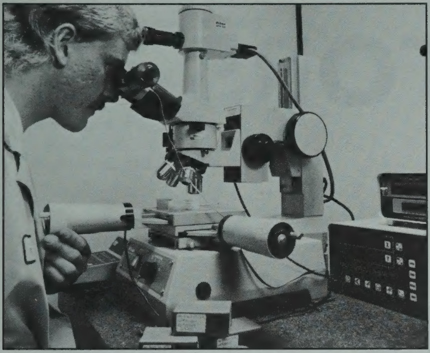
The vertically integrated state-of-the-art facility has the capability to produce the industry's broadest lines of microwave components, covering the frequency spectrum from dc to 50 GHz.

Vertical integration provides complete in-house control of every operation from design and development to fabrication, assembly and test. This capability enables M/A-COM Control Components Division to produce a range of low cost, high quality products from cellular to satellite applications.

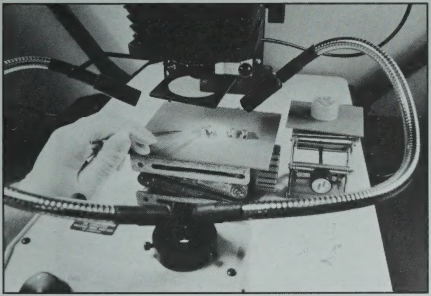


Computer Numerically Controlled (CNC) milling centers

Critical dimensions are verified using specialized measurement techniques as part of a comprehensive program of Total Quality Management (TQM).



Metallurgical microscope examines plating thickness and mechanical details



Photographic Evaluation

MIL-SPEC Approvals
Microwave components manufactured by M/A-COM Control Components Division have been used on various high reliability programs including military and commercial applications. The stringent testing required for these programs qualifies our components under a variety of military specifications.

QPL Approved

Electromechanical Switches	MIL-S-3928
Attenuators	MIL-A-3933
Terminations (Dummy Loads)	MIL-D-39030

Commercial and Direct Equivalents

Couplers	MIL-C-15370
Couplers	MIL-P-23971
Waveguide Adapters	MIL-A-22641

Total Quality Management

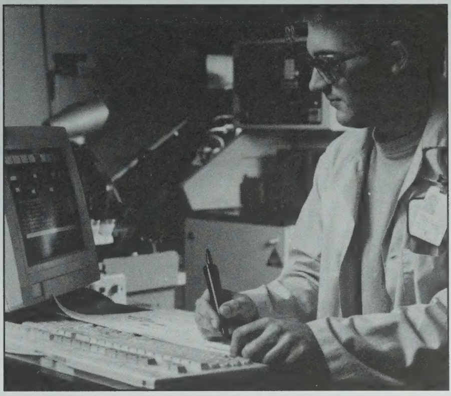
M/A-COM's Control Components Division exemplifies excellence in microwave component manufacturing.

Our extensive business systems play an integral role in every aspect of the design, manufacture and test of our broad product offering. These business systems include the latest generation MRP II, complemented by advanced CAE/CAD/CAM and SPC techniques.

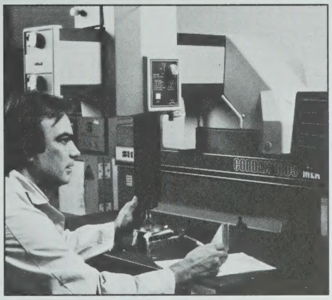
Capacity planning is routinely performed and automatically fed to our Shop Floor Control System.

The Shop Floor Control System is the essence of labor management and work station capacity planning. Work orders are managed by product routing through workstations and are tracked with a bar code data collection system providing on-line status. Shop parts are exposed to rigorous SPC techniques to ensure a total quality component.

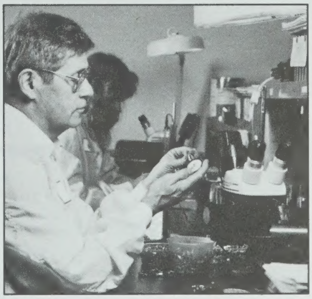
The advanced business systems are in place to provide complete customer satisfaction and represent our commitment to Total Quality Management and World Class Manufacturing.



Bar coding provides real-time information for manufacturing scheduling

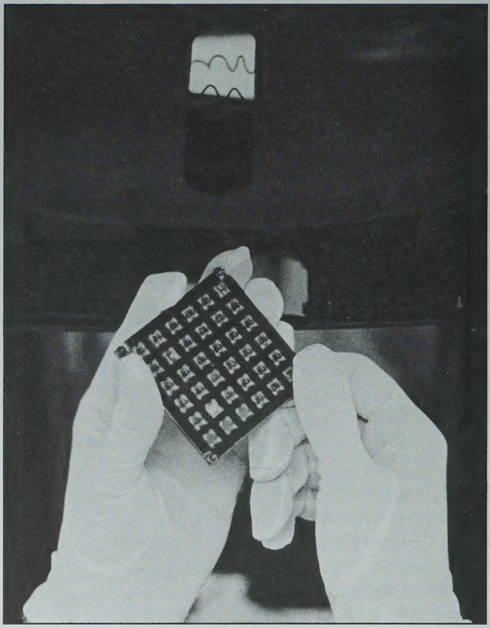


Computerized Coordinate Measurement System



In-Process Verification

FIXED COAXIAL ATTENUATORS



OSM® (SMA) Attenuators 5
5 & 10 Watt Attenuators 9
SMB Attenuators 10
Type N Attenuators 10
BNC Attenuators 11
7mm Precision Attenuators 11
Precision Calibrated Attenuators 12

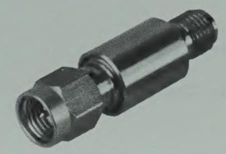
M/A-COM

Miniature OSM® (SMA) Fixed Coaxial Attenuators

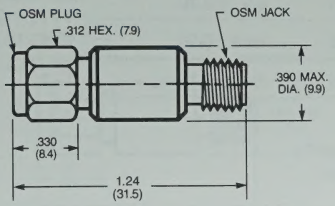
dc - 18 GHz

Features

- Thin Film Technology
- Complete In-House Capability
- Broadband Operation
- Also available:
  dc - 4 GHz and dc - 12.4 GHz
- Hex Body
- Jack to Jack, Plug to Plug
- 1 dB Steps 0 - 20
  10 dB Steps to 60



Mechanical Outline



Standard

Part Number Plug-Jack	Attenuation (dB)	QPL Approved[1] MIL-A-3933/16	Attenuation (dB)
2082-6191-03	3.0 ± 0.30	2082-4137-03N	3.0 ± 0.30
2082-6192-06	6.0 ± 0.30	2082-4137-06N	6.0 ± 0.30
2082-6193-10	10.0 ± 0.50	2082-4137-10N	10.0 ± 0.50
2082-6194-20	20.0 ± 0.50	2082-4137-20N	20.0 ± 0.50
2082-6195-30	30.0 ± 0.75	2082-4137-30N	30.0 ± 0.75

[1] M/A-COM part number reflects non-screened unit. For screened unit, change "N" to "S".

VSWR

dc - 4 GHz	1.15
4 - 12.4 GHz	1.25
12.4 - 18 GHz	1.35

Power
2 Watts Average*
500 Watts Peak

Finish
Passivated Stainless Steel

Weight
.30 oz. (8g) Max.

*Power derates linearly to 10% at 125°C.

Low Cost

Part Number Plug-Jack	Attenuation (dB)
2082-6145-03	3.0 ± 0.60
2082-6146-06	6.0 ± 0.75
2082-6147-10	10.0 ± 1.25
2082-6148-20	20.0 ± 1.50
2082-6148-30	30.0 ± 2.00

VSWR

dc - 4 GHz	1.20
4 - 12.4 GHz	1.40
12.4 - 18 GHz	1.60

Power
2 Watts Average*
500 Watts Peak

Finish
Passivated Stainless Steel

Weight
.30 oz. (8g) Max.

*Power derates linearly to 10% at 125°C.

dc - 26.5 GHz OSM® (SMA) Fixed Coaxial Attenuators

Miniature

Features

- Thin Film Technology
- Complete In-House Capability
- Hex Body
- Choice of Connector Configurations

Part Number Plug-Jack	Attenuation (dB)
2782-6251-03	3.0 ±0.30
2782-6251-06	6.0 ±0.30
2782-6251-10	10.0±0.50
2782-6251-20	20.0±0.75

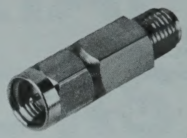
VSWR

dc - 4 GHz	1.15
4 - 12.4 GHz	1.25
12.4 - 18 GHz	1.35
18 - 26.5 GHz	1.50

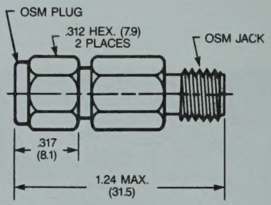
Power
2 Watts Average*
500 Watts Peak
Finish
Passivated Stainless Steel
Weight
.23 oz. (6.4g) Max.

---

*Power derates linearly to 10% at 125°C.



Mechanical Outline



Subminiature

Features

- Thin Film Technology
- Complete In-House Capability
- Hex Body
- Choice of Connector Configurations

Part Number Plug-Jack	Attenuation (dB)
2782-6051-03	3.0 ±0.30
2782-6051-06	6.0 ±0.30
2782-6051-10	10.0±0.50
2782-6051-20	20.0±0.75

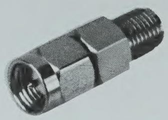
VSWR

dc - 4 GHz	1.15
4 - 12.4 GHz	1.25
12.4 - 18 GHz	1.35
18 - 26.5 GHz	1.50

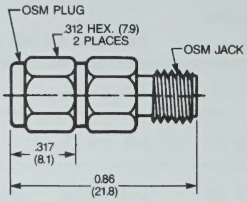
Power
2 Watts Average*
500 Watts Peak
Finish
Passivated Stainless Steel
Weight
.23 oz. (6.4g) Max.

---

*Power derates linearly to 10% at 125°C.

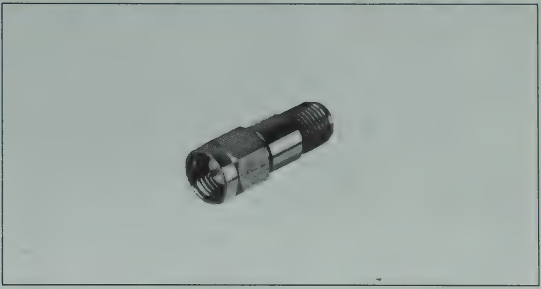


Mechanical Outline



Subminiature OSM® (SMA) Fixed Coaxial Attenuators

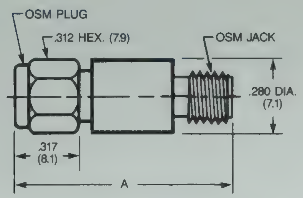
dc - 18 GHz • Round Body



Features

- Thin Film Technology
- Complete In-House Capability
- Small Size, .86 and 1.02 Overall Length
- Also available:
  dc - 4 GHz and dc - 12.4 GHz
- Hex Body
- Jack to Jack, Plug to Plug
- 1 dB Steps 0 - 20

Mechanical Outline



dB	Dim. A	Weight
0 - 12	0.86 (21.8mm)	.18 oz. max. (5g)
13 - 30	1.02 (25.9mm)	.21 oz. max. (6g)

Standard

Part Number Plug-Jack	Attenuation (dB)	QPL Approved[1] MIL-A-3933/25	Attenuation (dB)
2082-6040-03	3.0 ± 0.30	2082-4381-03N	3.0 ± 0.30
2082-6041-06	6.0 ± 0.30	2082-4381-06N	6.0 ± 0.30
2082-6042-10	10.0 ± 0.50	2082-4381-10N	10.0 ± 0.50
2082-6043-20	20.0 ± 0.75	2082-4381-20N	20.0 ± 0.60
2082-6044-30	30.0 ± 0.75	2082-4381-30N	30.0 ± 1.00

M/A-COM part number reflects non-screened unit. For screened unit, change "N" to "S".

VSWR (Standard)

dc - 4 GHz	1.15
4 - 12.4 GHz	1.25
12.4 - 18 GHz	1.35

Power

2 Watts Average*

500 Watts Peak

Finish

Passivated Stainless Steel

VSWR (QPL)

dc - 2.0 GHz	1.10
2.0 - 4.0 GHz	1.15
4.0 - 8.0 GHz	1.20
8.0 - 12.4 GHz	1.25
12.4 - 18 GHz	1.35

*Power derates linearly to 10% at 125°C.

Low Cost

Part Number Plug-Jack	Attenuation (dB)
2082-6141-03	3.0 ± 0.60
2082-6142-06	6.0 ± 0.75
2082-6143-10	10.0 ± 1.25
2082-6144-20	20.0 ± 1.50
2082-6144-30	30.0 ± 2.00

VSWR

dc - 4 GHz	1.20
4 - 12.4 GHz	1.40
12.4 - 18 GHz	1.60

Power

2 Watts Average*

500 Watts Peak

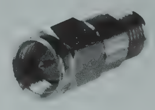
Finish

Passivated Stainless Steel

*Power derates linearly to 10% at 125°C.

Ultra Miniature OSM® (SMA) Fixed Coaxial Attenuators

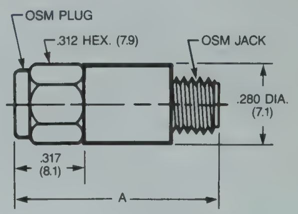
dc - 18 GHz



Features

- Thin Film Technology
- Complete In-House Capability
- Small Size, 0.75 and 0.86 Overall Length
- Light Weight
- 1 dB Steps 0 - 20 dB Available

Mechanical Outline



dB	Dim. A	Weight
1 - 12	0.75 (19.0mm)	.18 oz. max. (5g)
13 - 30	0.86 (21.8mm)	.19 oz. max. (5g)

Standard

Part Number Plug-Jack	Attenuation (dB)
2082-6340-03	3.0 ± 0.30
2082-6340-06	6.0 ± 0.30
2082-6340-10	10.0 ± 0.50
2082-6340-20	20.0 ± 0.75
2082-6340-30	30.0 ± 1.00

VSWR

dc - 4 GHz	1.15
4 - 12.4 GHz	1.25
12.4 - 18 GHz	1.35

Power

2 Watts Average*
200 Watts Peak

Finish

Passivated Stainless Steel

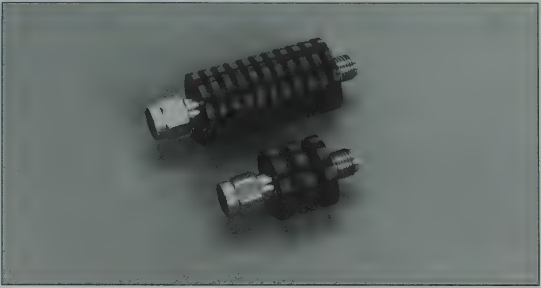
*Power derates linearly to 10% at 125°C.

5 & 10 Watt OSM® (SMA) Fixed Coaxial Attenuators

dc - 18 GHz

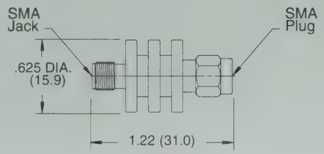
Features

- Low VSWR
- Flat Attenuation Response
- Precision SMA Connectors
- No Hazardous Beryllium Oxide
- N and TNC Custom Capability

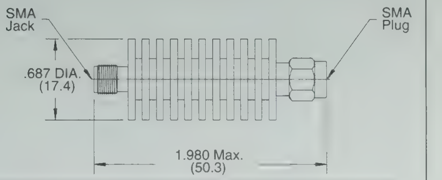


Mechanical Outline

5 Watt



10 Watt



5 Watt SMA

Part Number	Attenuation (dB)
2082-6524-03	3.0 ± 0.30
2082-6524-06	6.0 ± 0.30
2082-6524-10	10.0 ± 0.50
2082-6524-20	20.0 ± 0.75
2082-6524-30	30.0 ± 0.75

VSWR

dc - 4 GHz	1.15
4 - 12.4 GHz	1.25
12.4 - 18 GHz	1.35

Power

5 Watts Average*
500 Watts Peak

Temperature Range

-55 to 125°C

Weight

0.5 oz. (14g) Max.

*Power derates linearly to 10% at 125°C.

10 Watt SMA

Part Number	Attenuation (dB)
2082-6502-03	3.0 ± 0.50
2082-6502-06	6.0 ± 0.50
2082-6502-10	10.0 ± 0.75
2082-6502-20	20.0 ± 1.00

VSWR

dc - 8 GHz	1.20
8 - 12.4 GHz	1.30
12.4 - 18 GHz	1.45

Power

10 Watts Average*
500 Watts Peak

Temperature Range

-55 to 125°C

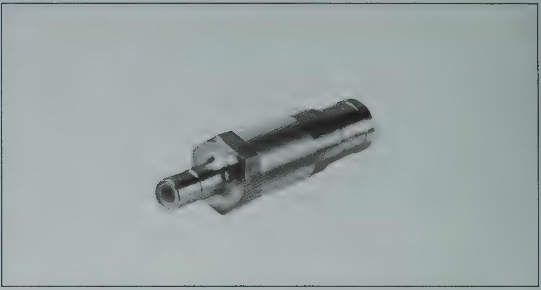
Weight

1.0 oz. (28g) Max.

*Power derates linearly to 10% at 125°C.

SMB & N Fixed Coaxial Attenuators

SMB Series (dc - 4 GHz)



Features

- 1 dB Steps 1 - 12 dB Available

Part Number Plug-Jack	Attenuation (dB)
5182-6001-03	3.0 ±0.30
5182-6001-06	6.0 ±0.30
5182-6001-10	10.0 ± 0.50

VSWR

dc - 2 GHz	1.15
2 - 4 GHz	1.25

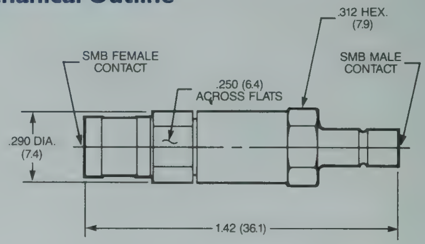
Power
2 Watts Average*
200 Watts Peak

Finish
Passivated Stainless Steel and
Nickel Plated Brass

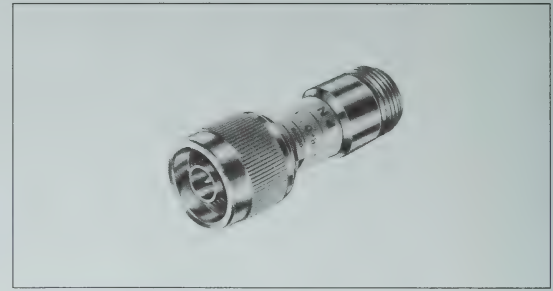
Weight
1.0 oz. (28g)

*Power derates linearly to 10% at 125°C.

Mechanical Outline



Type N (dc - 18 GHz)



Low Cost

Part Number Plug-Jack	Attenuation (dB)
3082-6141-03	3.0 ±0.60
3082-6142-06	6.0 ±0.75
3082-6143-10	10.0 ± 1.25
3082-6144-20	20.0 ± 1.50

VSWR

dc - 4 GHz	1.20
4 - 12.4 GHz	1.40
12.4 - 18 GHz	1.60

Standard

Part Number Plug-Jack	Attenuation (dB)
3082-6191-03	3.0 ±0.30
3082-6192-06	6.0 ±0.30
3082-6193-10	10.0 ± 0.50
3082-6194-20	20.0 ± 0.75
3082-6195-30	30.0 ± 1.00

VSWR

dc - 4 GHz	1.15
4 - 12.4 GHz	1.25
12.4 - 18 GHz	1.35

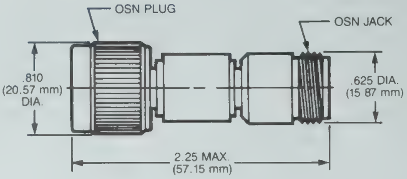
Power
2 Watts Average*
500 Watts Peak

Weight
2.5 oz. (70.9)

Finish
Passivated Stainless Steel

*Power derates linearly to 10% at 125°C.

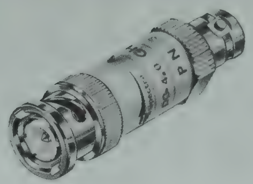
Mechanical Outline



BNC (dc - 4 GHz)

Features

- Rugged Construction
- Precision Operation

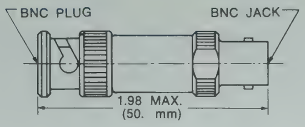


Part Number Plug-Jack	Attenuation (dB)
3282-6171-03	3.0 ± 0.30
3282-6172-06	6.0 ± 0.30
3282-6173-10	10.0 ± 0.30
3282-6174-20	20.0 ± 0.50

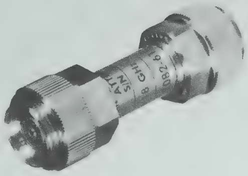
VSWR
dc - 4 GHz 1.25
Power
2 Watts Average*
500 Watts Peak
Finish
Nickel Plate
Weight
1.2 oz. (34g)

*Power derates linearly to 10% at 125°C.

Mechanical Outline



7mm Precision (dc - 18 GHz)



Part Number Plug-Jack	Attenuation (dB)
7082-6191-03	3.0 ± 0.30
7082-6192-06	6.0 ± 0.30
7082-6193-10	10.0 ± 0.50
7082-6194-20	20.0 ± 0.50
7082-6195-30	30.0 ± 0.75

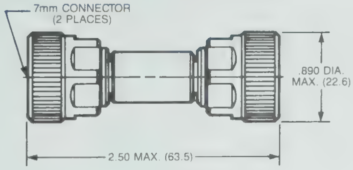
VSWR

dc - 4 GHz	1.10
4 - 12.4 GHz	1.20
12.4 - 18 GHz	1.30

Power
2 Watts Average*
100 Watts Peak
Finish
Connector Electropolished Stainless Steel
Weight
3.27 oz. (93g)

*Power derates linearly to 10% at 125°C.

Mechanical Outline



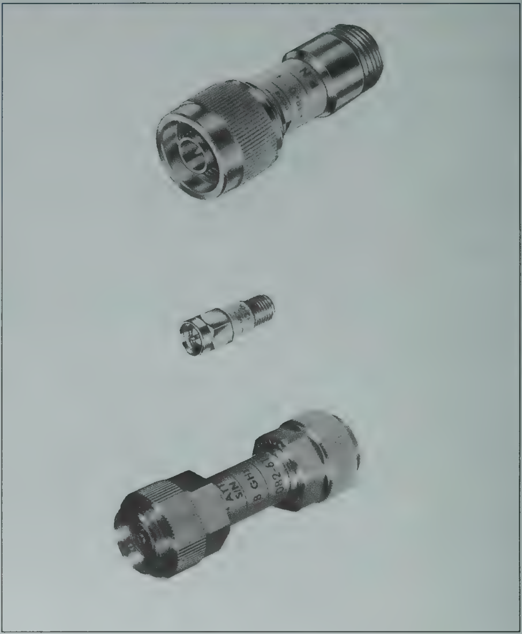
Precision Calibrated Fixed Coaxial Attenuators

Precision Calibrated Attenuators
(dc - 18 GHz)

Features

- Each unit supplied with calibration card showing frequency measurements

Part Number	Connector Type	Attenuation (dB)	VSWR	
2082-6190-03		3.0 ± 0.30	dc - 4 GHz	1.15
2082-6190-06	OSM (SMA)	6.0 ± 0.30	4 - 12.4 GHz	1.25
2082-6190-10		10.0 ± 0.50	12.4 - 18 GHz	1.35
2082-6190-20		20.0 ± 0.50		
3082-6190-03		3.0 ± 0.30	dc - 4 GHz	1.15
3082-6190-06	Type N	6.0 ± 0.30	4 - 12.4 GHz	1.25
3082-6190-10		10.0 ± 0.50	12.4 - 18 GHz	1.35
3082-6190-20		20.0 ± 0.75		
7082-6190-03		3.0 ± 0.30		
7082-6190-06		6.0 ± 0.30	dc - 4 GHz	1.10
7082-6190-10	7 mm	10.0 ± 0.50	4 - 12.4 GHz	1.20
7082-6190-20		20.0 ± 0.50	12.4 - 18 GHz	1.60
7082-6190-30		30.0 ± 0.75		



Precision Calibrated Attenuator Sets
(dc - 18 GHz)

Features

- Standard Nominal Values - 3, 6, 10 and 20 dB in each set
- Calibration cards supplied with frequency measurements at dc, 4, 12.4 and 18 GHz

Part Number	Connector Type	Attenuation (dB)	VSWR	
2082-6190-00	OSM (SMA)	3.0 ± 0.30 6.0 ± 0.30 10.0 ± 0.50 20.0 ± 0.50	dc - 4 GHz 4 - 12.4 GHz 12.4 - 18 GHz	1.15 1.25 1.35
3082-6190-00	Type N	3.0 ± 0.30 6.0 ± 0.30 10.0 ± 0.50 20.0 ± 0.75	dc - 4 GHz 4 - 12.4 GHz 12.4 - 18 GHz	1.15 1.25 1.35
7082-6190-00	7 mm	3.0 ± 0.30 6.0 ± 0.30 10.0 ± 0.50 20.0 ± 0.50	dc - 4 GHz 4 - 12.4 GHz 12.4 - 18 GHz	1.10 1.20 1.30

Power
2 Watts Average
200 Watts Peak*
Operating Temperature Range
-55°C to +125°C

*Applicable at 25°C.

FIXED COAXIAL TERMINATIONS

OSM® (SMA) Terminations 14
5 & 10 Watt Terminations 16
OSSM® (SSMA) Terminations 16
Type N Terminations 17
7mm Precision Terminations 17
BNC Terminations 18
TNC Terminations 18
OSP™ Blind Mate Terminations 19
Short Circuit Terminations 20
Dust Cap Terminations 22
QPL (Dummy Load) Terminations 24

M/A-COM

OSM® (SMA) Plug Terminations

OSM Miniature Plug Terminations are compact, fixed coaxial loads for terminating miniature coaxial lines at frequencies up to 26.5 GHz. Small size and weight and low VSWR allow numerous applications in both measurement and system use.

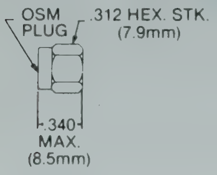


Fig. 1

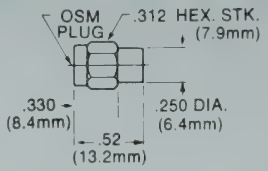


Fig. 2

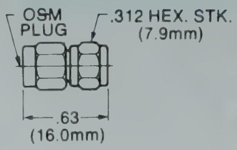
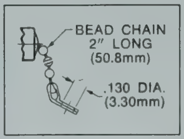


Fig. 3



Standard 2 inch Bead Chain

Ultra Short Plug Terminations

Part Number	Frequency (GHz)	VSWR dc-4 GHz	VSWR 4-12.4 GHz	VSWR 12.4-18 GHz	VSWR 18-26.5 GHz	Fig.	Power Watts Avg.[1]
2003-6110-00	dc - 26.5	1.05:1	1.10:1	1.20:1	1.30:1	1	0.5
2003-6117-00	dc - 18.0	1.05:1	1.05:1	1.10:1	-	1	
2003-6111-00		1.10:1	1.10:1	1.10:1	-	1	
2003-6112-00		1.05:1	1.15:1	1.20:1	-	1	
2003-6113-00		1.10:1	1.20:1	1.30:1	-	1	
2003-6115-00		1.10:1	1.20:1	1.30:1	-	1[5]	

Part Number	Frequency (GHz)	VSWR dc-4 GHz	VSWR 4-12.4 GHz	VSWR 12.4-18 GHz	VSWR 18-26.5 GHz	Fig.	Power Watts Avg.[1]
2001-6110-00	dc - 26.5	1.05:1	1.10:1	1.20:1	1.30:1	2	0.5
2001-6105-00	dc - 18.0	1.05:1	1.15:1	1.15:1	-	3[4]	1.0
2001-6100-00		1.05:1	1.15:1	1.15:1	-	3	
2001-6101-00		1.05:1	1.15:1	1.20:1	-	2	
2001-6143-00		1.09:1[2]	1.17:1[2]	1.23:1[2]	-	2	
2001-6118-00[3]		1.05:1	1.05:1	1.05:1	-	2	0.5
2001-6117-00		1.05:1	1.05:1	1.10:1	-	2	
2001-6111-00		1.10:1	1.10:1	1.10:1	-	2	
2001-6112-00		1.05:1	1.15:1	1.20:1	-	2	
2001-6113-00		1.10:1	1.20:1	1.30:1	-	2	
2001-6115-00		1.10:1	1.20:1	1.30:1	-	2[5]	

[1] See Derating Curve
[2] VSWR based on 1.05 + 0.01 f(GHz) Max.
[3] Calibrated termination supplied with data identifying actual VSWR values at 2.0, 4.0, 12.4 and 18.0 GHz. Finish is gold.
[4] With Bead Chain.
Standard finish is gold. For passivated stainless steel, change the part number suffix from -00 to -02. Part Number 2001-6143-00 available in gold only.

OSM® (SMA) Jack Terminations

OSM Miniature Jack Coaxial Terminations feature models offering extremely low VSWR at frequencies up to 26.5 GHz. The small size of these models makes them ideal for high-density system application and laboratory use.

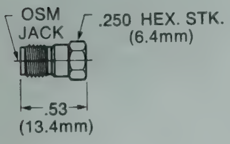


Fig. 1

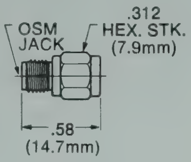
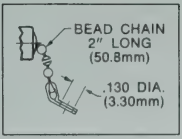


Fig. 2



Standard 2 inch Bead Chain

Part Number	Frequency (GHz)	VSWR dc-4 GHz	VSWR 4-12.4 GHz	VSWR 12.4-18 GHz	VSWR 18-26.5 GHz	Fig.	Power Watts Avg.[1]
2002-6110-00	dc - 26.5	1.05:1	1.10:1	1.20:1	1.30:1	1	0.5
2002-6105-00	dc - 18.0	1.05:1	1.15:1	1.15:1	-	2[3]	1.0
2002-6100-00		1.05:1	1.15:1	1.15:1	-	2	
2002-6101-00		1.05:1	1.15:1	1.20:1	-	1	
2002-6118-00[2]		1.05:1	1.05:1	1.05:1	-	1	0.5
2002-6117-00		1.05:1	1.05:1	1.10:1	-	1	
2002-6111-00		1.10:1	1.10:1	1.10:1	-	1	
2002-6112-00		1.05:1	1.15:1	1.20:1	-	1	
2002-6113-00		1.10:1	1.20:1	1.30:1	-	1	
2002-6114-00		1.10:1	1.20:1	1.30:1	-	1[3]	

[1] See Derating Curve

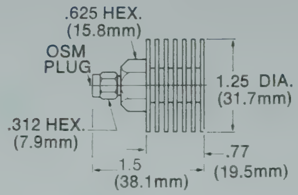
[2] Calibrated termination supplied with data identifying actual VSWR values at 2.0, 4.0, 12.4 and 18.0 GHz. Finish is gold.

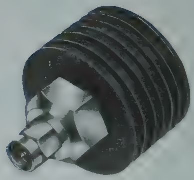
[3] With Bead Chain.

Standard finish is gold. For passivated stainless steel, change the part number suffix from -00 to -02. Part Number 2002-6118-00 available in gold only.

5 & 10 Watt OSM® (SMA) and OSSM® (SSMA) Terminations

High Power Terminations





PLUG PART NO.	Power Avg.* (Watts)	FIG.	VSWR dc-4 GHz	VSWR 4-12.4 GHz	VSWR 12.4-18 GHz
2001-6005-00	5	9	1.05:1	1.15:1	1.25:1
2001-6010-00	10	9	1.05:1	1.15:1	1.25:1

Finish:
Connector finish is passivated stainless steel, with stainless coupling nut and black anodized aluminum body.

*Power derates linearly to 10% at 125°C.

OSSM (SSMA) Subminiature

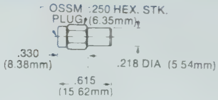


Fig. 1

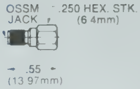
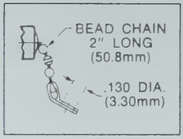
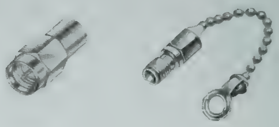


Fig. 2



Standard 2 inch Bead Chain



Power:
0.5 Watts Average*

Part Number Plug	Fig.	Part Number Jack	Fig.	Frequency (GHz)	VSWR	Weight Plug	Weight Jack
1001-6113-00	1	**1002-6113-00**	2	dc - 18	dc to 4 GHz 1.10 4 to 12.4 GHz 1.15 12.4 to 18 GHz 1.25	.08 oz.(2.3g)	.06 oz.(1.6g)
1001-6115-00	1*	**1002-6114-00**	2*			.11 oz.(3.0g)	.09 oz.(2.5g)

* With Bead Chain.

Finish:
Standard finish is gold. For passivated stainless steel, change the part number suffix from -00 to -02.

*Power derates linearly to 10% at 125°C.

Type N & 7mm Precision Terminations

Type N

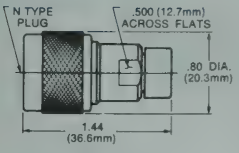


Fig. 1

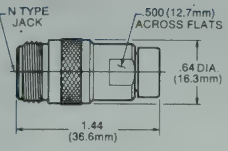


Fig. 2

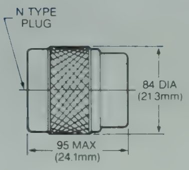
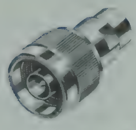
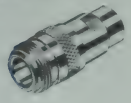
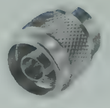
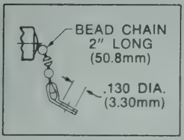


Fig. 3









Standard 2 inch Bead Chain

Part Number Plug	Fig.	Part Number Jack	Fig.	Frequency (GHz)	VSWR	Weight	
						Plug	Jack
3001-6113-00	1	**3002-6113-00**	2	dc - 12.4	dc to 8 GHz 1.15 8 to 12.4 GHz 1.20	1.5 oz.(41.7g)	1.4 oz.(38.5g)
3001-6121-02	3	-	-	dc - 12.4	dc to 12.4 GHz 1.15	1.3 oz. (37g)	-
3001-6125-02	3*	-	-			1.3 oz. (37g)	-
3001-6100-00	1	**3002-6100-00**	2	dc - 18	dc to 12.4 GHz 1.15 12.4 to 18 GHz 1.20	1.5 oz.(41.7g)	1.4 oz.(38.5g)
3001-6120-02	3	-	-			1.3 oz. (37g)	-
3001-6124-02	3*	-	-			1.3 oz. (37g)	-

* With Bead Chain.

Power:
2.0 Watts Average*

Finish:
Passivated Stainless Steel

*Power derates linearly to 10% at 125°C.

7mm Precision

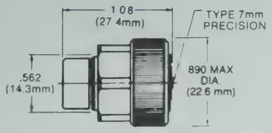
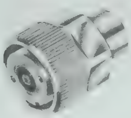


Fig. 1



Part Number	Fig.	Frequency (GHz)	VSWR	Weight
7000-6100-00	1	dc to 18	dc to 10 GHz 1.05 10 to 18 GHz 1.10	1.5 oz.(42.6g)

Power:
2.0 Watts Average*

Finish:
Electropolished Stainless Steel

*Power derates linearly to 10% at 125°C.

BNC & TNC Terminations

BNC Series

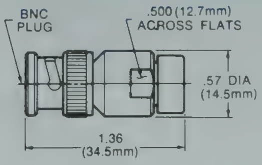


Fig. 1

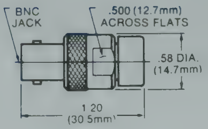
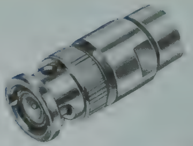
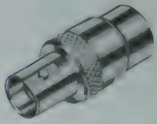


Fig. 2





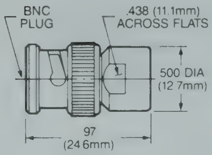
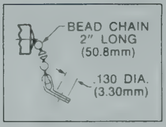


Fig. 3



Standard 2 inch Bead Chain

Part Number Plug	Fig.	Part Number Jack	Fig.	Frequency (GHz)	VSWR	Weight	
						Plug	Jack
3201-6100-00	1	**3202-6100-00**	2	dc - 12.4	dc to 12.4 GHz 1.20	1.0 oz.(27.2g)	0.6 oz.(18.3g)
3201-6102-02	3	-	-	dc - 4	dc to 4 GHz 1.15	0.9 oz. (26g)	-
3201-6103-02	3*	-	-			0.9 oz. (26g)	-

* With Bead Chain.

Power:
2.0 Watts Average*

Finish:
Passivated Stainless Steel

*Power derates linearly to 10% at 125°C.

TNC Series

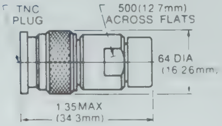


Fig. 1

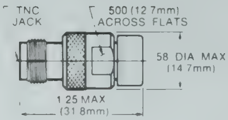
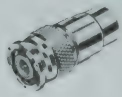


Fig. 2



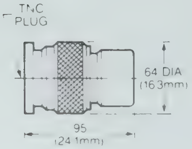
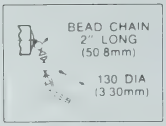


Fig. 3



Standard 2 inch Bead Chain

Part Number Plug	Fig.	Part Number Jack	Fig.	Frequency (GHz)	VSWR	Weight	
						Plug	Jack
3101-6100-00	1	**3102-6100-00**	2	dc - 18	dc to 12.4 GHz 1.15 12.4 to 18 GHz 1.25	1.1 oz.(31.4g)	0.8 oz.(22.3g)
3101-6120-02	3	-	-	dc - 18	dc to 12.4 GHz 1.15 12.4 to 18 GHz 1.25	0.9 oz. (26g)	-
3101-6124-02	3*	-	-			0.9 oz. (26g)	-
3101-6121-02	3	-	-	dc - 12.4	dc to 4 GHz 1.15 4 to 12.4 GHz 1.20	0.9 oz. (26g)	-
3101-6125-02	3*	-	-			0.9 oz. (26g)	-

* With Bead Chain.

Power:
2.0 Watts Average*

Finish:
Passivated Stainless Steel

*Power derates linearly to 10% at 125°C.

OSP (BMA) • Miniature • Blind Mate

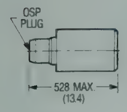


Fig. 1

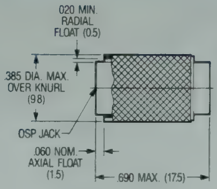


Fig. 2

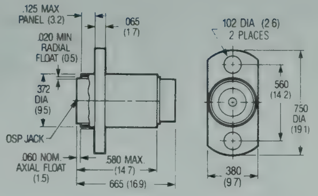


Fig. 3

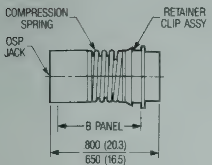
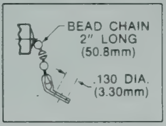
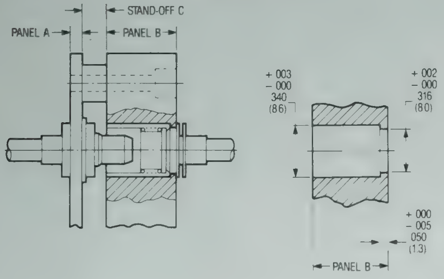


Fig. 4



Standard 2 inch Bead Chain

Recommended Mounting Detail Fig. 4



Panel A ±.003		Panel B ±.003		Stand-Off C +.050 −.000	
Inches	(mm)	Inches	(mm)	Inches	(mm)
.090	(2.3)	.375	(9.5)	.285	(7.2)
.090	(2.3)	.438	(11.1)	.222	(5.6)
.090	(2.3)	.500	(12.7)	.160	(4.1)
.125	(3.2)	.375	(9.5)	.250	(6.4)
.125	(3.2)	.438	(11.1)	.187	(4.7)
.125	(3.2)	.500	(12.7)	.125	(3.2)

Recommended removal tool part number 4598-5015-54 is described elsewhere in this catalog.

Part Number Plug	Fig.	Part Number Jack	Fig.	VSWR dc-4 GHz	VSWR 4-12.4 GHz	VSWR 12.4-18 GHz
4501-6110-00	1	**4502-6110-00**	2	1.05	1.10	1.20
4501-6111-00[1]	1	**4502-6111-00**	2	1.10	1.10	1.10
4501-6112-00	1	**4502-6112-00**	2	1.05	1.15	1.20
4501-6113-00	1	**4502-6113-00**	2	1.10	1.20	1.30
4501-6115-00	1*	**4502-6115-00**	2*	1.10	1.20	1.30
-	-	**4506-6110-00**	3	1.05	1.10	1.20
-	-	**4506-6111-00**	3	1.10	1.10	1.10
-	-	**4506-6112-00**	3	1.05	1.15	1.20
-	-	**4506-6113-00**	3	1.10	1.20	1.30
-	-	**4510-6110-00**	4	1.05	1.10	1.20
-	-	**4510-6111-00**[2]	4	1.10	1.10	1.10
-	-	**4510-6112-00**	4	1.05	1.15	1.20
-	-	**4510-6113-00**	4	1.10	1.20	1.30

* With Bead Chain.

[1] For test applications requiring locking of OSP components to test port adapter part number 4582-2700-05, order locking sleeve 4598-4013-00 and termination part number 4511-6111-00.

[2] For test applications requiring locking of OSP compoents to test port adapter part number 4581-2700-05, order locking sleeve 4598-4014-00 and termination part number 4512-6111-00.

Frequency:
dc - 18.0 GHz

Power:
0.5 Watts Average*

Finish:
Standard finish is gold plate.

*Power derates linearly to 10% at 125˚C.

Plug Short Circuit Terminations

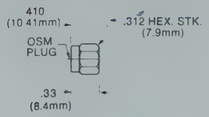


Fig. 1

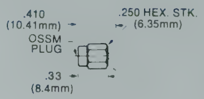
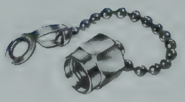


Fig. 2



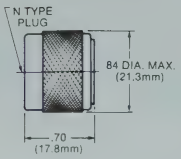


Fig. 3

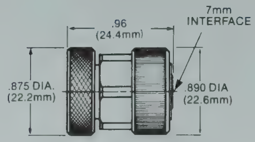
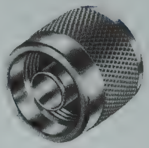


Fig. 4



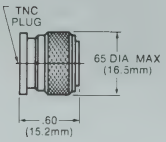


Fig. 5

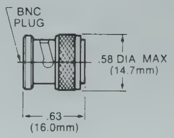


Fig. 6

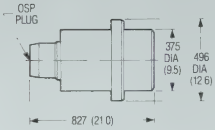


Fig. 7

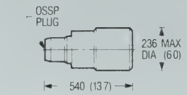
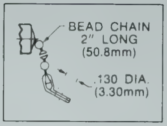


Fig. 8



Standard 2 inch Bead Chain

Type	Part Number	Fig.	Finish	Weight
OSM (SMA)	**2021-1314-00**	1	1	.12 oz. (3.4g)
	2021-1312-00	1*	1	.13 oz. (3.7g)
OSSM (SSMA)	**1021-1314-00**	2	1	.09 oz. (2.6g)
	1021-1312-00	2*	1	.1 oz. (2.9g)
Type N	**3001-1314-02**	3	2	.9 oz. (25.2g)
	3001-1312-02	3*	2	.91 oz. (25.5g)
7mm	**7000-1314-02**	4	3	1.9 oz. (53.2g)
TNC	**3101-1314-02**	5	2	.5 oz. (14.0g)
	3101-1312-02	5*	2	.51 oz. (14.3g)
BNC	**3201-1314-02**	6	2	.4 oz. (11.2g)
	3201-1312-02	6*	2	.41 oz. (11.5g)
OSP	**4511-1314-00**[1]	7	4	.32 oz. (9.0g)
OSSP	**4721-1314-00**	8	4	.07 oz. (2.0g)

* With Bead Chain.

[1] For test applications requiring locking of OSP components to test port adapter part number 4582-2700-05, order short circuit termination 4511-1314-00 and locking sleeve 4598-4013-00.

Finish:
1 Gold plated. For passivated stainless steel, change the part number suffix from -00 to -02.
2 Passivated stainless steel.
3 Electropolished stainless steel.
4 Gold plated.

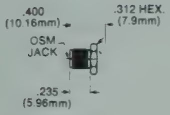


Fig. 1

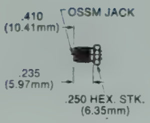


Fig. 2

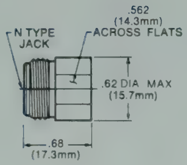


Fig. 3

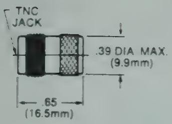


Fig. 4

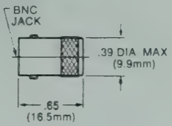
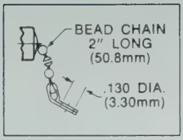


Fig. 5



Standard 2 inch Bead Chain

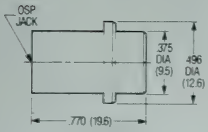


Fig. 6

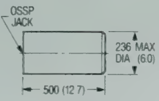


Fig. 7

Type	Part Number	Fig.	Finish	Weight
OSM (SMA)	**2020-1314-00**	1	1	.09 oz. (2.6g)
	2020-1312-00	1*	1	.1 oz. (2.9g)
OSSM (SSMA)	**1020-1314-00**	2	1	.07 oz. (2.0g)
	1020-1312-00	2*	1	.08 oz. (2.3g)
Type N	**3002-1314-02**	3	2	.75 oz. (21.1g)
	3002-1312-02	3*	2	.76 oz. (21.3g)
TNC	**3102-1314-02**	4	2	.22 oz. (6.3g)
	3102-1312-02	4*	2	.23 oz. (6.4g)
BNC	**3202-1314-02**	5	2	.21 oz. (6.0g)
	3202-1312-02	5*	2	.22 oz. (6.3g)
OSP	**4512-1314-00**[1]	6	4	.32 oz. (9.0g)
OSSP	**4720-1314-00**	7	4	.10 oz. (2.8g)

* With Bead Chain.

[1] For test applications requiring locking of OSP components to test port adapter part number 4581-2700-05, order short circuit termination 4512-1314-00 and locking sleeve 4598-4014-00.

Finish:
1 Gold plated. For passivated stainless steel, change the part number suffix from -00 to -02.
2 Passivated stainless steel.
3 Electropolished stainless steel.
4 Gold plated.

Plug Dust Cap Terminations

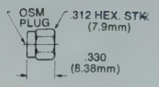


Fig. 1

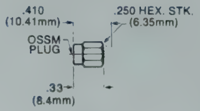
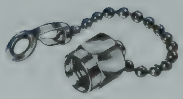


Fig. 2



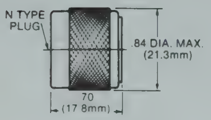


Fig. 3

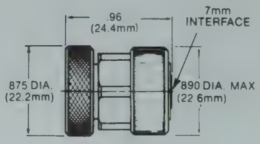
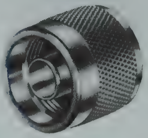


Fig. 4



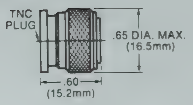


Fig. 5

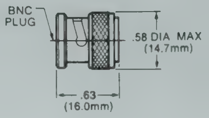
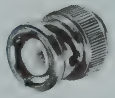


Fig. 6



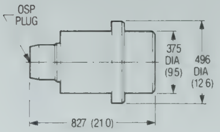


Fig. 7

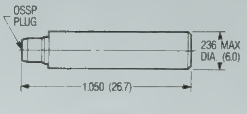
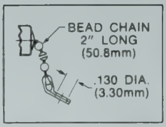


Fig. 8



Standard 2 inch Bead Chain

Type	Part Number	Fig.	Finish	Weight
OSM (SMA)	**2021-1311-00**	1	1	.12 oz. (3.4g)
	2021-1310-00	1*	1	.13 oz. (3.6g)
OSSM (SSMA)	**1021-1311-00**	2	1	.09 oz. (2.6g)
	1021-1310-00	2*	1	.1 oz. (2.8g)
Type N	**3001-1315-02**	3	2	.9 oz. (25.7g)
	3001-1310-02	3*	2	.1 oz. (2.8g)
7mm	**7000-1315-02**	4	3	1.8 oz. (51.4g)
TNC	**3101-1315-02**	5	2	.5 oz. (14.0g)
	3101-1310-02	5*	2	.51 oz. (14.3g)
BNC	**3201-1315-02**	6	2	.4 oz. (11.4g)
	3201-1310-02	6*	2	.41 oz. (11.5g)
OSP	**4511-1315-00**[1]	7	4	.32 oz. (9.0g)
OSSP	**4721-1315-00**	8	4	.14 oz. (4.0g)

* With Bead Chain.

[1] For test applications requiring locking of OSP components to test port adapter part number 4582-2700-05, order short circuit termination 4511-1315-00 and locking sleeve 4598-4013-00.

Finish:
1 Gold plated. For passivated stainless steel, change the part number suffix from -00 to -02.
2 Passivated stainless steel.
3 Electropolished stainless steel.
4 Gold plated.

Jack Dust Cap Terminations

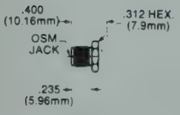


Fig. 1

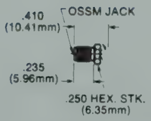


Fig. 2

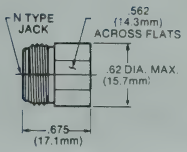


Fig. 3

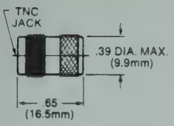


Fig. 4

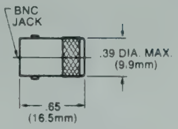


Fig. 5

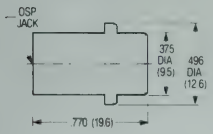


Fig. 6

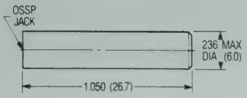
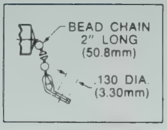


Fig. 7



Standard 2 inch Bead Chain

Type	Part Number	Fig.	Finish	Weight
OSM (SMA)	**2020-1311-00**	1	1	.08 oz. (2.2g)
	2020-1310-00	1*	1	.09 oz . (2.6g)
OSSM (SSMA)	**1020-1311-00**	2	1	.07 oz. (2.0g)
	1020-1310-00	2*	1	.08 oz. (2.2g)
Type N	**3002-1315-02**	3	2	.7 oz. (20.0g)
	3002-1310-02	3*	2	.71 oz. (20.0g)
TNC	**3102-1315-02**	4	2	.21 oz. (6.0g)
	3102-1310-02	4*	2	.22 oz. (6.2g)
BNC	**3202-1315-02**	5	2	.21 oz. (6.0g)
	3202-1310-02	5*	2	.22 oz. (6.2g)
OSP	**4512-1315-00**[1]	6	4	.32 oz. (9.0g)
OSSP	**4720-1315-00**	7	4	.15 oz. (4.3g)

* With Bead Chain.

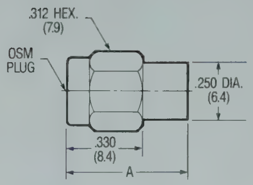
[1] For test applications requiring locking of OSP components to test port adapter part number 4581-2700-05, order short circuit termination 4512-1315-00 and locking sleeve 4598-4014-00.

Finish:

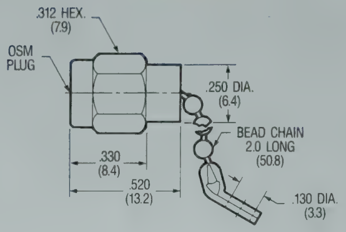
1 Gold plated. For passivated stainless steel, change the part number suffix from -00 to -02.
2 Passivated stainless steel.
3 Electropolished stainless steel.
4 Gold plated.

QPL (Dummy Load) Terminations

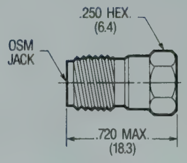
MIL-D-39030/3



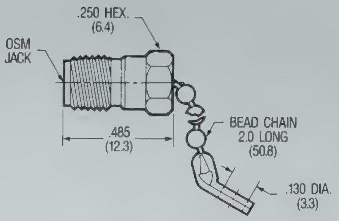
38



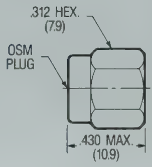
39



40



41



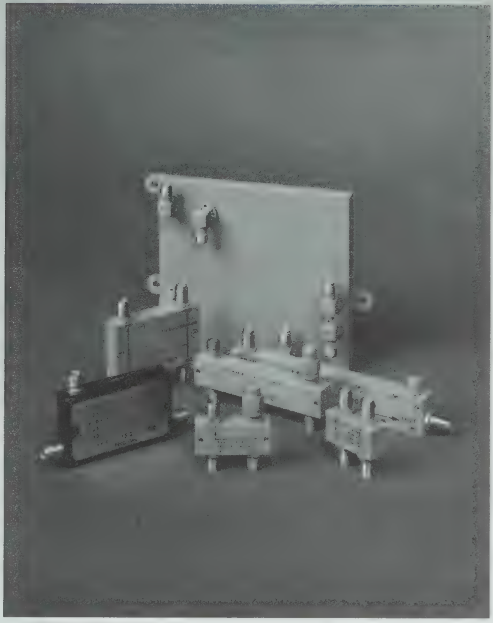
42

Military Part Number	M/A-COM Part Number	Outline	Dim. A Inches (mm)
-01	2001-4178-00N	38	.520 (13.2)
-02	2001-4182-02N	38	.520 (13.2)
-03	2001-4173-00N	39	—
-04	2001-4173-02N	39	—
-05	2002-4065-00N	40	—
-06	2002-4065-02N	40	—
-07	2002-4066-00N	41	—
-08	2002-4066-02N	41	—
-09	2001-4302-00N	38	.520 (13.2)
-10	2001-4303-00N	38	.520 (13.2)
-11	2001-4301-00N	42	—
-12	2001-4294-00N	38	.550 Max. (14.0)
-13	2001-4304-00N	39	—
-15	2001-4305-00N	38	.520 (13.2)

M/A-COM part number reflects non-screened unit. For screened unit, change "N" to "S."

COUPLERS

3 dB 90° Crossover Hybrid Couplers 26
Mini-Series • Octave Bandwidth Directional Couplers 27
Multi-octave Directional Couplers 28
Ultra Broadband Directional Couplers 29



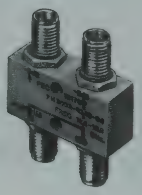
M/A-COM

3 dB 90° Crossover Hybrid Couplers

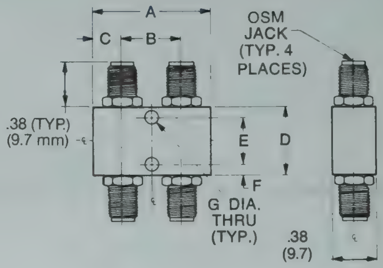
Features

- 90° Quadrature Phase
- Multi-octave
- Frequency Range: 2.0 to 18 GHz
- Temperature Range: -65°C to +125°C
- Meets MIL-E-5400 and MIL-E-16400 Environments

3 dB quadrature mini-hybrids are the ultimate in compact, rugged high stress environment components. The crossover feature of the location of both outputs on one side allows simplicity in system or subsystem design. Multi-octave coverage of the complete frequency spectrum, along with high isolation performance, qualifies them as an asset to any system.



Mechanical Outline



NOTE: All dimensions are ± .020 except mounting hole diameters (± .005) and mounting hole location (± .010).

Specifications

Part Number	Case Style	Frequency Range (GHz)	Amplitude Balance (dB)	Insertion Loss Max, (dB)	Isolation Min. (dB)	VSWR Max.	Power Avg. (W)	Power Pk. (kW)
2032-6371-00	1	2.0 - 18.0	± 1.0	.60*	20**	1.45	50	3
2032-6374-00	2	6.5 - 18.0	± 0.5	.60	18	1.35	30	3
2032-6375-00***	3	4.0 - 18.0	± 0.5	.80	18	1.45	100	5

* Insertion loss is 1.2 dB from 6.0 to 12.4 GHz and 1.5 dB from 12.4 to 18.0 GHz

** Isolation is 15 dB from 12.4 GHz to 18.0 GHz

***High Power

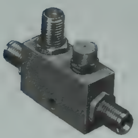
Mechanical Specifications

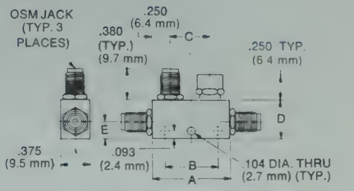
Case Style	Size, Inches (mm) A	B	C	D	E	F	G	Weight oz.	g
1	1.0 (25.4)	.50 (12.7)	.25 (6.35)	.50 (12.7)	.31 (7.9)	.09 (2.4)	.104 (2.6)	.60	17
2	1.88 (47.6)	1.41 (35.9)	.23 (5.7)	1.3 (33)	1.06 (26.9)	.12 (3.1)	.14 (3.6)	1.76	50
3	1.50 (38.1)	1.00 (25.4)	.25 (6.4)	1.10 (28.0)	.90 (23.0)	.10 (2.5)	.104 (2.6)	1.41	40

Mini-Series • Octave Bandwidth Directional Couplers

- **Smallest and Lightest Couplers Available**
- **.5 Through 18 GHz Including Wideband Units**
- **High Directivity — Low VSWR**
- **Meets MIL-E-5400 and MIL-E-16400 Environments**

This complete line of mini-series coaxial stripline couplers features the smallest and lightest units available anywhere, typically measuring 1 inch by ½ inch by ⅜ inch thick and weighing only about ½ ounce. These units are the ultimate in performance and will consistently outperform their conservative specifications. All of the units use OSM female stainless steel precision connectors.





NOTE: All dimensions are ± .020, except mounting hole diameters (± .005) and mounting hole location (± .010).

SPECIFICATIONS

PART NO.	CASE STYLE	FREQUENCY RANGE (GHz)	COUPLING (INCLUDES FREQUENCY SENSITIVITY) (dB)	FREQUENCY SENSITIVITY (dB)	INSERTION LOSS max. (dB)	DIRECTIVITY min.. (dB)	VSWR (max.) PRI. LINE	VSWR (max.) SEC. LINE	POWER (INPUT) AVG. IN. (W)	POWER (INPUT) AVG. REFL. (W)	POWER (INPUT) PK. (kW)
2020-6600-06	7	0.5-1.0	6 ±1.0	±0.60	0.15	25	1.10	1.10	50	4	4
2020-6601-10	7		10 ±1.0	±0.75	0.15	25	1.10	1.10	50	10	4
2020-6602-20	7		20 ±1.0	±0.75	0.15	25	1.10	1.10	50	50	4
2020-6603-30	7		30 ±1.0	±0.75	0.15	25	1.10	1.10	50	50	4
2020-6604-06	5	1.0-2.0	6 ±1.0	±0.60	0.20	25	1.15	1.15	50	4	4
2020-6605-10	5		10 ±1.0	±0.75	0.20	25	1.15	1.15	50	10	4
2020-6606-20	5		20± 1.0	±0.75	0.20	25	1.15	1.15	50	50	4
2020-6607-30	6		30 ±1.0	±0.75	0.20	25	1.15	1.15	50	50	4
2020-6608-06	3	2.0-4.0	6 ±1.0	±0.60	0.20	22	1.15	1.15	50	4	4
2020-6609-10	3		10 ±1.0	±0.75	0.20	22	1.15	1.15	50	10	4
2020-6610-20	3		20 ±1.0	±0.75	0.20	22	1.15	1.15	50	50	4
2020-6611-30	4		30 ±1.0	±0.75	0.20	22	1.15	1.15	50	50	4
2020-6612-06	2	2.6-5.2	6 ±1.0	±0.60	0.25	20	1.25	1.25	50	4	4
2020-6613-10	2		10 ±1.0	±0.75	0.25	20	1.25	1.25	50	10	4
2020-6614-20	2		20 ±1.0	±0.75	0.25	20	1.25	1.25	50	50	4
2020-6615-30	1		30 ±1.0	±0.75	0.25	20	1.25	1.25	50	50	4
2020-6616-06	2	4.0-8.0	6 ±.75	±0.50	0.25	22	1.25	1.25	50	4	4
2020-6617-10	2		10 ±.75	±0.50	0.25	20	1.25	1.25	50	10	4
2020-6618-20	2		20 ±.75	±0.50	0.25	20	1.25	1.25	50	50	4
2020-6619-30	1		30 ±.75	±0.50	0.25	20	1.25	1.25	50	50	4
2020-6620-06	2	7.0-12.4	6 ±1.0	±0.40	0.40	15	1.35	1.35	50	4	4
2020-6621-10	1		10 ±.75	±0.40	0.40	20	1.30	1.35	50	10	4
2020-6622-20	1		20 ±.75	±0.50	0.30	18	1.35	1.35	50	50	4
2020-6623-30	1		30 ±1.0	±0.50	0.30	17	1.35	1.35	50	50	4
2020-6624-06	2	7.0-18.0	6 ±1.0	±0.50	0.50	15	1.35	1.35	50	4	3
2020-6625-10	1		10 ±1.0	±0.50	0.40	20	1.30	1.40	50	10	3
2020-6626-20	1		20 ±1.0	±0.75	0.50	15**	1.45	1.45	50	50	3
2020-6627-30	8		30 ±1.0	±0.75	0.50	15**	1.45	1.45	50	50	3
2020-6628-06	2	12.4-18.0	6 ±.75	±0.40	0.50	15	1.40	1.40	50	4	2
2020-6629-10	1		10 ±.75	±0.40	0.40	20	1.30	1.40	50	10	2
2020-6630-20	1		20 ±.75	±0.50	0.50	17	1.45	1.45	50	50	2
2020-6631-30	8		30 ±1.0	±0.50	0 50	12	1.45	1.45	50	50	2

MECHANICAL SPECIFICATIONS

CASE STYLE	A	B	C	D	E	WEIGHT oz.	WEIGHT g
1	1.00 (25.4 mm)	N/A	.50 (12.7 mm)	.55 (13.9 mm)	.22 (5.6 mm)	0.62	17.6
2				.50 (12.7 mm)		0.60	17.0
3	1.16 (29.4 mm)	.34 (8.7 mm)	.66 (16.7 mm)	.50 (12.7 mm)		0.64	18.2
4				.55 (13.9 mm)		0.67	19.0
5	1.78 (45.2 mm)	.94 (23.8 mm)	1.28 (32.5 mm)	.50 (12.7 mm)		0.82	23.2
6				.55 (13.9 mm)		0.87	23.3
*7	3.00 (76.2 mm)	1.00 (25.4 mm)	2.50 (63.5 mm)	.75 (19.1 mm)	.31 (7.9 mm)	1.50	43.0
8	1.00 (25.4 mm)	N/A	.50 (12.7 mm)	.63 (15.9 mm)	.22 (5.6 mm)	0.67	19.0

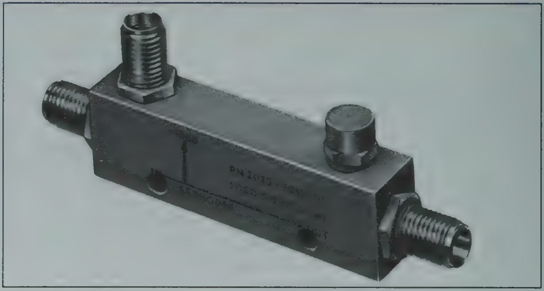
*NOTE Case style seven has four mounting holes located symmetrically to the two shown dotted in figure.
**12dB from 12.4 to 18.0 GHz.

Multi-octave Directional Couplers

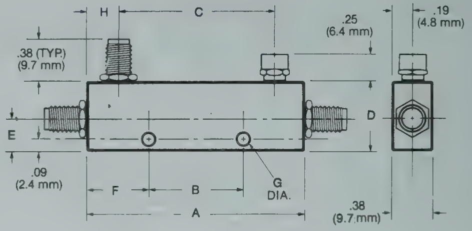
Features

- Flat Frequency Response
- Frequency Range: 0.5 - 18.0 GHz
- Multi-octave Bandwidths
- Temperature Range: -54°C to +125°C
- Meets MIL-E-5400 and MIL-E-16400 Environments

These compact directional couplers operate over multi-octave bandwidths with ± 0.3 dB flatness and are available to cover standard frequency bands from 0.5 to 18.0 GHz. Each coupler is constructed in a rugged sealed aluminum housing to ensure compatibility with MIL-E-5400. The input, output and coupled output ports are stainless steel OSM connectors per MIL-C-39012. The isolated port is terminated with a non-removable precision 50 ohm termination.



Mechanical Outline



NOTE: All dimensions are ± .020 except mounting hole diameters (± .005) and mounting hole location (± .010).

Specifications

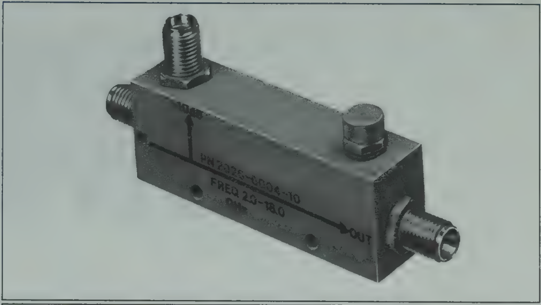
Part Number	Case Style	Frequency Range (GHz)	Coupling (incl. Frequency Sensitivity) (dB)	Frequency Sensitivity (dB)	Insertion Loss Max. (dB)	Directivity Min. (dB)	VSWR Max. Pri. Line	VSWR Max. Sec. Line	Power (Input Port) Avg.. In. (W)	Power (Input Port) Avg. Refl. (W)	Power (Input Port) Pk. (kW)
2025-6001-06	1	0.5 - 2.0	6 ± 1	± 0.4	0.3	18	1.15	1.15	50	4	4
2025-6002-10	1	0.5 - 2.0	10 ± 1	± 0.4	0.3	18	1.15	1.15	50	10	4
2025-6004-20	1	0.5 - 2.0	20 ± 1	± 0.4	0.3	22	1.15	1.15	50	50	4
2025-6010-10	2	2.0 - 8.4	10 ± 1	± 0.3	0.35	18	1.25	1.25	50	10	4
2025-6012-20	2	2.0 - 8.4	20 ± 1	± 0.3	0.35	20	1.25	1.25	50	50	4
2025-6013-06	3	4.0 - 12.4	6 ± 1	± 0.4	0.5	15	1.30	1.30	50	4	4
2025-6014-10	3	4.0 - 12.4	10 ± 1	± 0.4	0.5	15	1.30	1.30	50	10	4
2025-6016-20	3	4.0 - 12.4	20 ± 1	± 0.4	0.5	15	1.30	1.30	50	50	4
2025-6017-06	4	6.0 - 18.0	6 ± 1	± 0.4	0.7	15	1.40	1.40	50	4	2
2025-6018-10	4	6.0 - 18.0	10 ± 1	± 0.4	0.6	16	1.40	1.40	50	10	2
2025-6020-20	4	6.0 - 18.0	20 ± 1	± 0.4	0.6	15	1.40	1.40	50	50	2

Mechanical Specifications

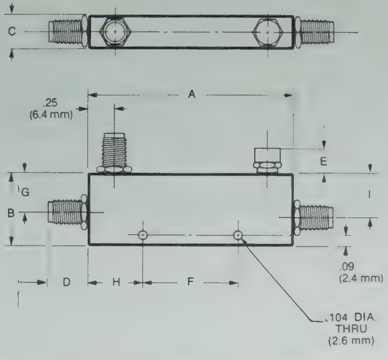
Case			Size, Inches (mm)						Weight	
Style	A	B	C	D	E	F	G	H	oz.	g
1	4.92 (125)	3.5 (89)	4.42 (112)	.60 (15.2)	.27 (6.73)	.71 (18.1)	.143 (3.63)	.25 (6.4)	2.10	58.8
2	1.99 (50.5)	.88 (22.2)	1.44 (36.6)	.63 (15.9)	.28 (7.11)	.56 (14.2)	.143 (3.63)	.28 (7.06)	1.05	29.4
3	1.21 (30.7)	.38 (9.7)	.69 (17.6)	.60 (15.2)	.22 (5.56)	.42 (10.6)	.104 (2.64)	.26 (6.55)	0.74	20.7
4	1.16 (29.5)	.50 (12.7)	.65 (16.5)	.57 (14.4)	.25 (6.35)	.33 (8.33)	.104 (2.64)	.25 (6.45)	0.69	19.3

Features

- Frequency Range: 0.5 - 26.5 GHz
- Standard Coupling Values: 10 and 20 dB
- Temperature Range: -54°C to +125°C
- Connectors: OSM® (SMA) per MIL-C-39012 or 3.5 mm
- Isolated Port with Non-removable 50 ohm Termination



Mechanical Outline



NOTE: All dimensions are ± .020 except mounting hole diameters (± .005) and mounting hole location (± .010).

Specifications

Part Number	Case Style	Frequency Range (GHz)	Coupling (incl. Frequency Sensitivity) (dB)	Frequency Sensitivity (dB)	Insertion Loss Max. (dB)	Directivity Min. (dB)	VSWR Max. Pri. Line	Power (Input Port) Avg.. In. (W)	Avg. Refl. (W)	Pk. (kW)
2026-6004-10	2	2.0 - 18.0	10 ± 1	± 0.5	.30 + .03fGHz	15[1]	1.35	50	10	3
2026-6006-20	2	2.0 - 18.0	20 ± 1	± 0.5	.30 + .03fGHz	18[2]	1.35	50	50	3
2026-6007-10	1	1.0 - 18.0	10 ± 1	± 0.5	.30 + .05fGHz	15[1]	1.40	50	10	3
2026-6010-10	3	0.5 - 18.0	10 ± 1	± 1.0	.90 + .03fGHz	15[1]	1.50	50	10	3
2026-6013-10	3	0.5 - 26.5[4]	10 ± 1.5	± 1.5	.90 + .06fGHz	15[3]	1.60	50	10	3
2026-6015-20	3	0.5 - 26.5[4]	20 ± 1.5	± 1.5	.90 + .06fGHz	15[3]	1.60	50	50	3

1. 12 dB from 12.4 to 18 GHz
2. 15 dB from 12.4 to 18 GHz
3. 12 dB from 12.4 to 26.5 GHz
4. Connectors are 3..5mm.

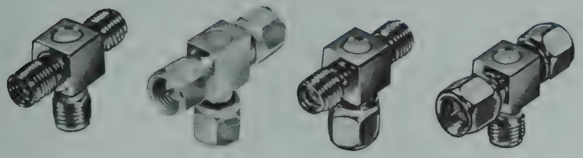
Mechanical Specifications

Case Style	Size, Inches (mm) A	B	C	D	E	F	G	H	I	Weight oz.	g
1	3.8 (97)	.69 (17.5)	.38 (9.7)	.38 (9.7)	.25 (6.4)	2.31 (58.7)	.39 (9.9)	.75 (19)	.44 (11.1)	2.0	56
2	2.0 (50.8)	.69 (17.5)	.38 (9.7)	.38 (9.7)	.25 (6.4)	.95 (24.2)	.38 (9.7)	.53 (13.5)	.42 (10.7)	1.3	37
3	4.4 (111.8)	.73 (18.5)	.38 (9.7)	.38 (9.7)	.25 (6.4)	2.90 (73.7)	.48 (12.2)	.75 (19)	.48 (12.2)	2.5	71

POWER DIVIDERS

Unmatched Tees 31
Two-Way • Wilkinson • Isolated Power Dividers 32
Four-Way • Wilkinson • Isolated Power Dividers 33
Eight-Way • Wilkinson • Isolated Power Dividers 34
Two-, Four- & Eight-Way • Tapered • Isolated Power Dividers 35
Two-Way • Tapered • Ultra Broadband Power Dividers 36
Three-Way • Tapered • Isolated Power Dividers 37

Non-Isolated Unmatched Tees

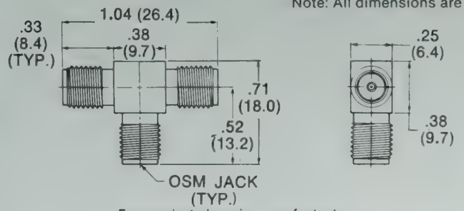


- **Small Size**
- **Broad Band**
- **Economical Power Divider**

OSM Miniature Unmatched Coaxial Tees provide a convenient means of separating an input signal into two components. The units are used where isolation between the outputs and VSWR are not primary considerations. Temperature range is −54°C to +125°C.

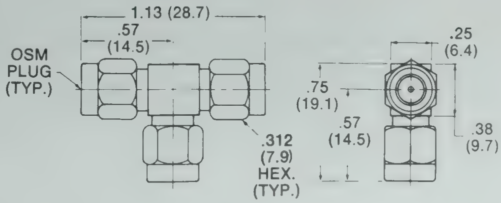
Note: All dimensions are ± .020.

PART NUMBER	**2041-6201-00**
MODEL NUMBER	20200-1
JACK-JACK-JACK ADAPTER	



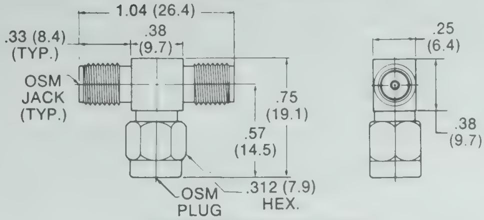
For passivated version, see footnote.

PART NUMBER	**2041-6202-00**
MODEL NUMBER	20200-4
PLUG-PLUG-PLUG ADAPTER	



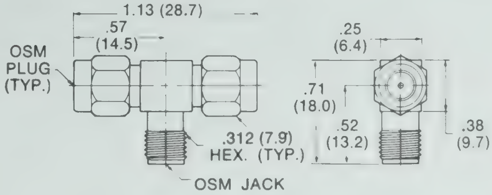
For passivated version, see footnote.

PART NUMBER	**2041-6203-00**
MODEL NUMBER	20200-2
JACK-PLUG-JACK ADAPTER	



For passivated version, see footnote.

PART NUMBER	**2041-6204-00**
MODEL NUMBER	20200-3
PLUG-JACK-PLUG ADAPTER	



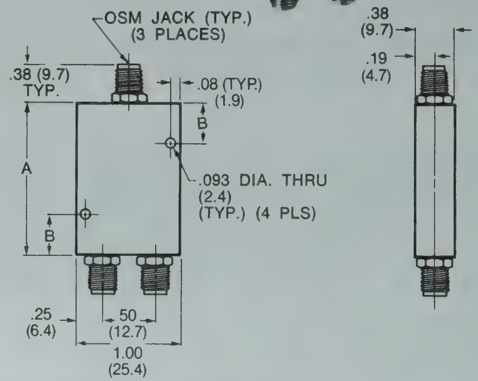
For passivated version, see footnote.

All unmatched coaxial tees have OSM connectors. For OSSM connectors, simply change the first digit in the part number from "2" to "1". For example, 1041-6201-00. Standard units have gold-plated connectors ("-00" suffix). For passivated stainless steel finish connectors, simply change the "-00" to "-02" in the part number

Two-Way • Wilkinson • Isolated Power Dividers

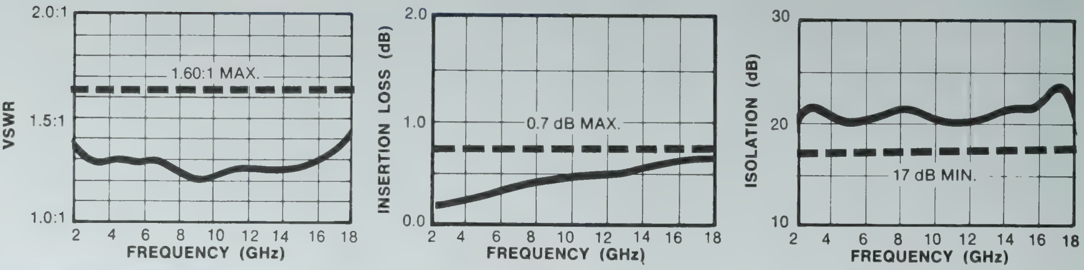
- **Excellent Amplitude And Phase Balance**
- **High Isolation Between Output Ports**
- **Low VSWR, Small Size And Light Weight**
- **Octave and Multi-Octave Frequency Coverage.**
- **Power: 10 Watts Input Maximum with Matched Terminations**
- **Meets MIL-E-5400 and MIL-E-16400 Environments**

This series of two-way, in-phase stripline power dividers demonstrates excellent performance as well as small size and light weight. These octave and multi-octave power dividers have high isolation, low VSWR and excellent amplitude and phase balance. Their rugged construction meets MIL-E-5400 environmental conditions, making them ideal for high performance microwave systems.



NOTE: All dimensions are ± .020, except mounting hole diameters (± .005) and mounting hole location (± .010).

TYPICAL PERFORMANCE PART NO. 2089-6208-00



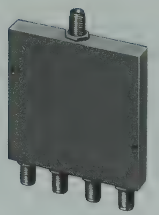
SPECIFICATIONS

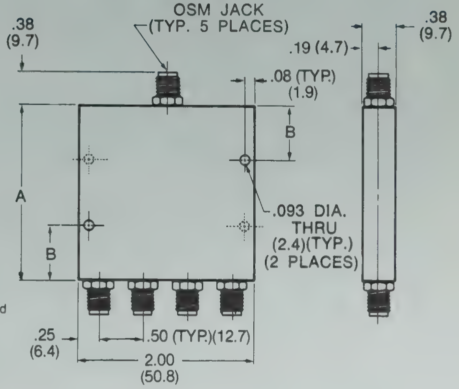
PART NO.	FREQUENCY RANGE (GHz)	VSWR (max.)	ISOLATION dB (min.)	INSERTION LOSS dB (max.)	OUTPUT UNBALANCE		MAXIMUM INPUT POWER* (watts)	SIZE, INCHES (mm)		WEIGHT	
					AMP. (dB)	PHASE (deg.)		A	B	oz.	g
2089-6201-00	1.0-2.0	1.25	20	0.25	0.2	4.0	2.0	2.0 (50.8)	0.5 (12.7)	1.5	43
2089-6202-00	2.0-4.0	1.35	20	0.25	0.2	4.0	2.0	2.0 (50.8)	0.5 (12.7)	1.5	43
2089-6203-00	4.0-8.0	1.35	20	0.3	0.2	6.0	2.0	1.38 (35)	0.4 (10.2)	1.2	35
2089-6204-00	8.0-12.4	1.60	20	0.4	0.25	6.0	2.0	1.38 (35)	0.4 (10.2)	1.2	35
2089-6205-00	12.4-18.0	1.70	17	0.6	0.25	6.0	3.0	1.38 (35)	0.4 (10.2)	1.2	35
2089-6206-00	0.5-2.0	1.30	20	0.4	0.2	4.0	4.0	2.8 (71.2)	0.5 (12.7)	2.0	57
2089-6207-00	2.0-8.0	1.50	18	0.4	0.25	8.0	4.0	2.25 (57.2)	0.5 (12.7)	1.3	37
2089-6208-00	2.0-18.0	1.60	17	1.0	0.25	8.0	10.0	2.25 (57.2)	0.5 (12.7)	1.3	37
2089-6209-00	4.0-18.0	1.60	17	0.6	0.25	8.0	4.0	1.63 (41.4)	0.5 (12.7)	1.3	37
2089-6210-00	7.0-18.0	1.70	17	0.6	0.25	8.0	3.0	1.38 (35)	0.4 (10.2)	1.2	35

*Maximum input power with output loads of VSWR ≤ 2.0:1.
Derate to 10% of listed value when arbitrarily terminated.

- **Octave And Multi-Octave Frequency Coverage.**
- **Low Insertion Loss**
- **Excellent Phase Balance**
- **High Isolation Between Output Ports.**
- **Low VSWR.**
- **Power: 20 Watts Maximum**
- **Meets MIL-E-5400 and MIL-E-16400 Environments**

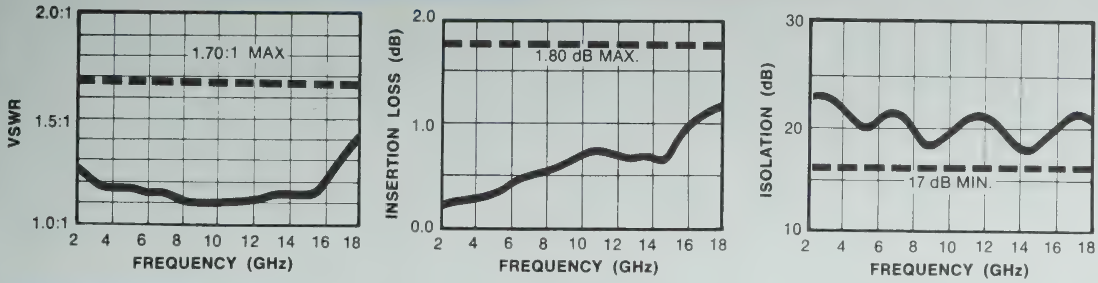
These four-way in-phase power dividers combine excellent strip transmission line design techniques with small size and light weight and still achieve superb performance over wide multi-octave frequency ranges as well as over single octave bandwidths. These units may be used in reverse to combine in-phase signals applied to them. They are also available in a variety of "n" way output ports as well as custom designed to your particular application.





NOTE: All dimensions are ± .020, except mounting hole diameters (± .005) and mounting hole location (± .010).

TYPICAL PERFORMANCE PART NO. 2089-6408-00



SPECIFICATIONS

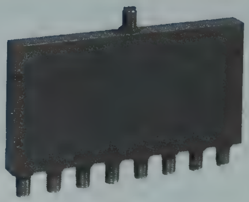
PART NO.	FREQUENCY RANGE (GHz)	VSWR (max.)	ISOLATION dB (min.)	INSERTION LOSS dB (max.)	OUTPUT UNBALANCE		MAXIMUM INPUT POWER* (watts)	SIZE, INCHES (mm)		WEIGHT	
					AMP. (dB)	PHASE (deg.)		A	B	oz.	g
2089-6401-00**	1.0-2.0	1.35	20	0.50	0.40	6	4.0	3.0 (76.2)	0.63 (15.9)	4.0	115
2089-6402-00	2.0-4.0	1.35	20	0.50	0.40	6	4.0	2.0 (50.8)		2.8	80
2089-6403-00	4.0-8.0	1.50	20	0.50	0.40	8	4.0	2.0 (50.8)		2.8	80
2089-6404-00	8.0-12.4	1.70	18	0.75	0.50	8	4.0	2.0 (50.8)		2.8	80
2089-6405-00	12.4-18.0	1.70	15	1.20	0.50	8	6.0	2.0 (50.8)		2.8	80
2089-6406-00**	0.5-2.0	1.45	20	0.70	0.40	6	4.0	2.92 (74.2)		4.0	115
2089-6407-00**	2.0-8.0	1.60	18	0.80	0.50	12	8.0	4.0 (102)		5.2	149
2089-6408-00	2.0-18.0	1.70	17	1.80	0.50	12	20.0	3.0 (76.2)		4.0	115
2089-6409-00	4.0-18.0	1.70	15	1.20	0.50	12	8.0	2.0 (50.8)		2.8	80
2089-6410-00	7.0-18.0	1.60	15	1.20	0.50	12	6.0	2.0 (50.8)		2.8	80

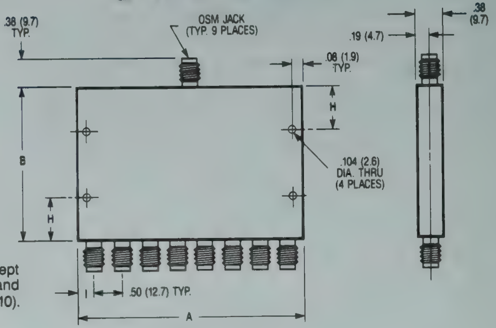
*Maximum input power with output loads of VSWR ≤ 2.0:1.
Derate to 10% of listed value when arbitrarily terminated.
**These units have four mounting holes symmetrically located as shown.

Eight-Way • Wilkinson • Isolated Power Dividers

- **Octave and Multi-Octave Frequency Coverage**
- **Excellent Amplitude & Phase Balance**
- **Low Insertion Loss**
- **Low VSWR**
- **Meets MIL-E-5400 and MIL-E-16400 Environments**

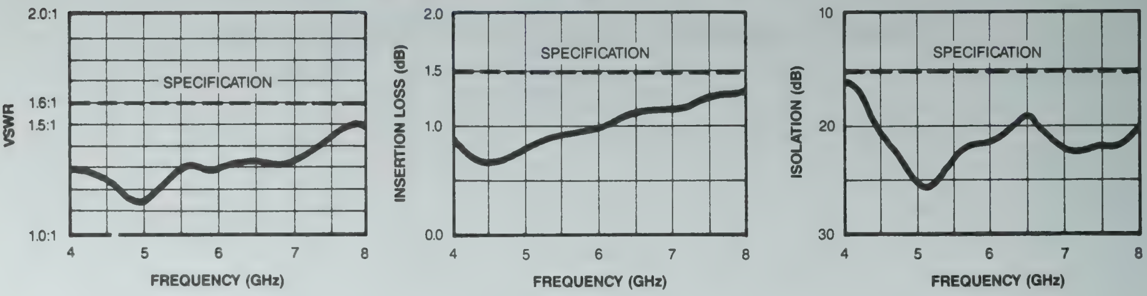
These new eight-way in-phase power dividers combine reliable strip transmission line design techniques with small size and light weight to achieve excellent performance over octave and multi-octave frequency ranges. They may also be used to combine in-phase signals applied at the outputs. Their rugged construction meets stringent MIL-E-5400 environmental conditions. OSM/SMA female connectors are standard while other common connectors are available upon request.





NOTE: All dimensions are ± .020 except mounting hole diameters (± .005) and mounting hole locations (± .010).

Typical Performance Part No. 2089-6803-00



SPECIFICATIONS

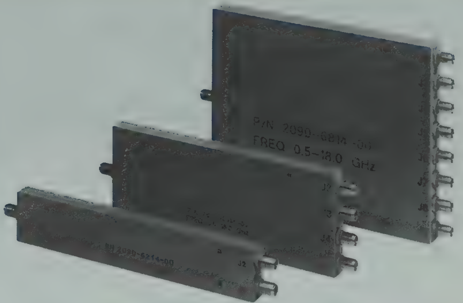
PART NO.	FREQUENCY RANGE (GHz)	VSWR (max.)	ISOLATION dB (min.)	INSERTION LOSS dB (max.)	OUTPUT UNBALANCE		MAXIMUM INPUT POWER* (watts)	SIZE, INCHES				WEIGHT (NOM.) oz.
					AMP. (dB)	PHASE (deg.)		A	B	H	I	
2089-6801-00	1.0-2.0	1.5:1	20	1.0	0.8	8	6.0	4.5	5.0	1.0	0.50	15
2089-6802-00	2.0-4.0	1.5:1	18	1.0	0.8	10	6.0	4.0	2.0	0.5	0.25	12
2089-6803-00	4.0-8.0	1.6:1	15	1.5	0.8	16	6.0	4.0	2.0	0.5	0.25	12
2089-6804-00	8.0-12.4	1.7:1	15	1.7	0.8	16	6.0	4.0	2.0	0.5	0.25	12
2089-6805-00	12.4-18.0	1.7:1	15	2.2	0.8	24	10.0	4.0	2.0	0.5	0.25	12
2089-6806-00	0.5-2.0	1.5:1	20	1.5	0.8	8	12.0	4.5	5.0	1.0	0.50	15
2089-6807-00	2.0-8.0	1.6:1	15	2.0	1.2	16	12.0	4.0	2.0	0.5	0.25	12
2089-6808-00	2.0-18.0	1.8:1	15	3.3	1.8	24	30.0	4.5	5.0	1.0	0.50	15
2089-6810-00	7.0-18.0	1.8:1	15	2.5	1.5	24	10.0	4.0	2.0	0.5	0.25	12

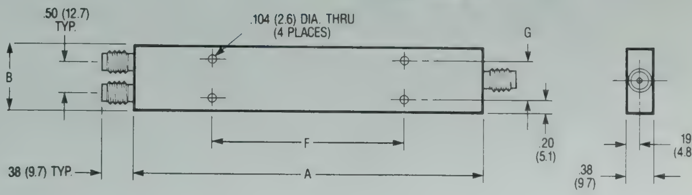
*Maximum input power with output of VSWR ≤ 2.0:1
Derate to 10% of listed value when arbitrarily terminated.

Two-, Four- & Eight-Way • Tapered • Isolated Power Dividers

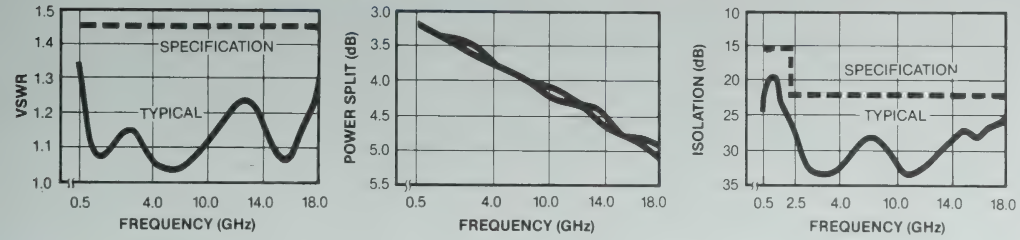
- **Broadband Performance 0.5-18.0 GHz**
- **Low Insertion Loss**
- **Excellent Amplitude and Phase Balance**
- **Power: 50 Watts Maximum**
- **Meets MIL-E-5400 and MIL-E-16400 Environments**

These are the smallest in-phase isolation 0.5-18.0 GHz power dividers available. Rugged stripline construction, housed in sealed lightweight packages insure reliable operation in the roughest environments. OSM/SMA stainless steel connectors are standard. Contact the factory for other connector designs.





Typical Performance Part No. 2090-6214-00



SPECIFICATIONS

PART NO.	NO. OF OUTPUTS	FREQUENCY RANGE (GHz)	VSWR (max.)		ISOLATION (dB min.) FREQUENCY (GHz)		INSERTION LOSS dB (max.)	OUTPUT UNBALANCE				MAXIMUM INPUT POWER* (watts)
								AMP. (dB) FREQUENCY (GHz)		PHASE (deg.) FREQUENCY (GHz)		
			Input	Ouput	0.5-2.5	2.5-18.0		0.5-2.5	2.5-18.0	0.5-2.5	2.5-18.0	
2090-6214-00	2	0.5-18.0	1.45	1.45	15	22	0.25 + 0.11f	0.4	0.4	5	5	50
2090-6414-00	4	0.5-18.0	1.6	1.5	15	20	0.7 + 0.21f	0.6	1.0	8	12	50
2090-6814-00	8	0.5-18.0	1.7	1.5	15	20	1.0 + 0.25f	0.8	1.4	10	16	50

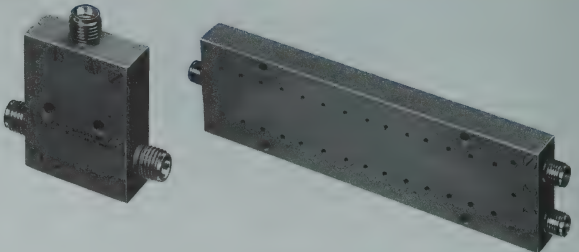
*50 Watts with 1.2:1 max. load VSWR.
25 Watts with 2:1 max. load VSWR.

MECHANICAL SPECIFICATIONS

PART NO.	SIZE, INCHES (mm)				WEIGHT	
	A	B	F	G	oz.	g
2090-6214-00	5.50 (139.7)	1.00 (25.4)	4.00 (101.6)	.60 (15.2)	3.4	96.6
2090-6414-00	5.20 (132.1)	2.00 (50.8)	3.20 (81.3)	1.60 (45.7)	16	448
2090-6814-00	5.20 (132.1)	4.00 (101.6)	3.20 (81.3)	3.60 (91.4)	30	840

Two-Way • Tapered • Ultra Broadband Power Dividers

- **Octave, Multi-Octave And Decade Frequency Coverage**
- **Low Insertion Loss**
- **Excellent Amplitude And Phase Balance**
- **High Isolation Between Output Ports**
- **Low VSWR**
- **Power: 80 Watts Maximum**
- **Meets MIL-E-5400 and MIL-E-16400 Environments**



New designs include operation through 26 GHz and retain the performance of lower frequency units. These units are ideal for multi-octave ECM systems. These units function as either dividers or combiners to facilitate system performance.

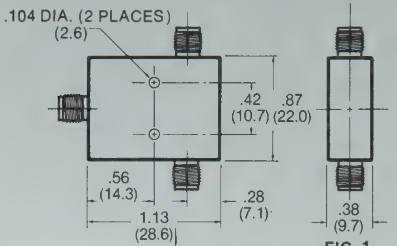


FIG. 1

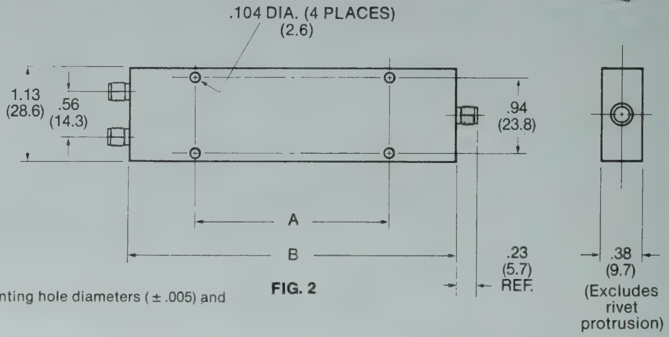
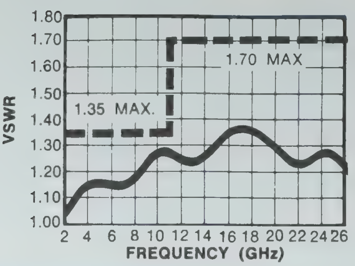
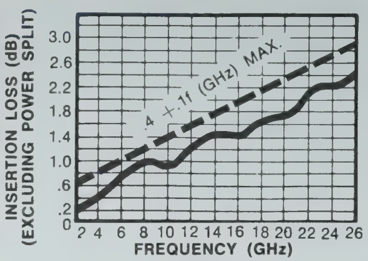


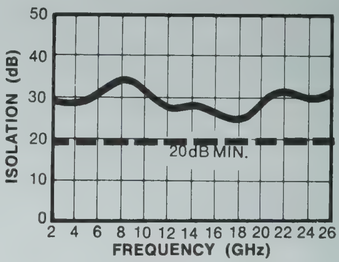
FIG. 2

NOTE: All dimensions are ± .020, except mounting hole diameters (± .005) and mounting hole location (± .010).

TYPICAL PERFORMANCE PART NO. 2090-6202-00







SPECIFICATIONS

PART NO.	MODEL NO.	FREQUENCY RANGE (GHz)	VSWR (max.)	ISOLATION dB (min.)	INSERTION LOSS dB (max.)	OUTPUT UNBALANCE		MAX. INPUT POWER** (watts)	SIZE, INCHES (mm)		WEIGHT	
						AMP. (dB)	PHASE (deg.)		A	B	FIG.	oz. g
2090-6201-00	204928	0.5-26.0	1.35 (0.5 to 11) GHz 1.70 (11 to 26) GHz	12 (0.5 to 1) GHz 20 (1 to 26) GHz	0.4 +.15f	0.5	5*	80	9.40 (239)	11.02 (291)	2	8.0 226
2090-6202-00	204948	2.0-26.0	1.35 (2 to 11) GHz 1.70 (11 to 26) GHz	20	0.4 +.1f	0.5	5*	40	2.40 (61.1)	4.02 (102)	2	2.9 83
2090-6203-00	204968	8.0-26.0	1.50 (8 to 18) GHz 1.90 (18 to 26) GHz	18	0.4 + .05f	0.5	5*	20	—	—	1	1.1 30
2090-6204-00	204927	0.5-18.0	1.35 (0.5 to 11) GHz 1.70 (11 to 18) GHz	20 (0.5 to 3) GHz 23 (3 to 18) GHz	0.2 +.17f	0.3	5	80	9.40 (239)	11.02 (291)	2	8.0 226
2090-6205-00	204947	2.0-18.0	1.35 (2 to 11) GHz 1.70 (11 to 18) GHz	20 (2 to 3) GHz 23 (3 to 18) GHz	0.2 +.07f	0.3	5	40	2.40 (61.1)	4.02 (102)	2	2.9 83
2090-6210-00	204967	8.0-18.0	1.50	18	0.2 +.03f	0.3	5	20	—	—	1	1.1 30

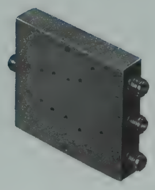
*To 18 GHz

**Maximum input power with output loads of VSWR ≤ 2.0:1. Derate to 10% of listed value when arbitrarily terminated.

Note: f is frequency in GHz.

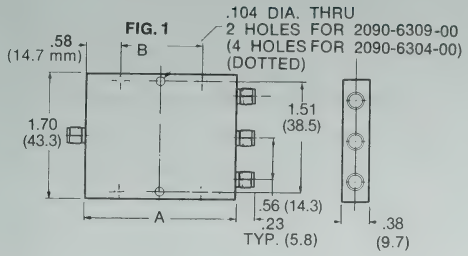
Three-Way • Tapered • Isolated Power Dividers

- **Good Amplitude And Phase Balance**
- **High Isolation Between Output Ports**
- **Low VSWR, Small Size And Light Weight**
- **Octave, Multi-Octave And Decade Frequency Coverage**
- **Low Insertion Loss**
- **Power: 80 Watts Maximum**
- **Meets MIL-E-5400 and MIL-E-16400 Environments**



Power Dividers are compact stripline units with wide bandwidth and multiple outputs. Tapered line transformers and internal terminations provide low VSWR at all ports and high isolation between all output ports. Phase and amplitude tracking of all outputs is excellent due to the symmetrical designs. Combinations of three-way and two-way power dividers in one package are available for custom applications.

FIG. 1



NOTE: All dimensions are ± .020, except mounting hole diameters (± .005) and mounting hole location (± .010). Height dimension excludes rivet protrusion.

SPECIFICATIONS

PART NO.	MODEL NO.	FREQUENCY RANGE (GHz)	VSWR (max.)	ISOLATION dB (min.)	INSERTION LOSS dB (max.)	OUTPUT UNBALANCE		MAXIMUM INPUT POWER** (watts)	FIG.	SIZE, INCHES (mm)		WEIGHT	
						AMP. (dB)	PHASE (deg.)			A	B	oz.	g
2090-6304-00	204827	0.5-18.0	1.6	18	0.4 + .24f	0.5†	*	80	1	11.0 (280)	9.84 (250.0)	11.4	322
2090-6309-00	204857	4.0-18.0	1.5	18	0.5 + .08f	0.5	*	40	1	2.02 (51.3)	—	2.1	60

*Not phase matched.

**Maximum input power with output loads of VSWR ≤ 2.0:1. Derate to 10% of listed value when arbitrarily terminated.

†0.5 dB (0.5 to 10 GHz), 1.0 dB (10 to 18 GHz)

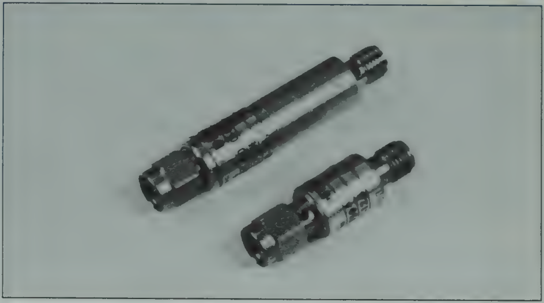
Note: f is frequency in GHz.

DETECTORS

Back Diode Detectors 39
Biased Schottky Detectors 40
Zero Biased Schottky Diode Detectors 41
Point Contact Diode Detectors 42

Back Diode Detectors With Replaceable Diodes

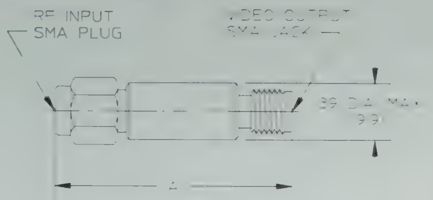
2085-Series



Specifications

Bias Current	0
Output Polarity	Negative[4]
Video Resistance	80 Ohms Nominal[2]
Maximum Power	40 mW CW or 3 erg spike (except 2085-6018-00) 2085-6018, 25 mW CW or 2 erg spike
Temperature Stability	±1 dB over operating range of -65°C to +100°C
Tracking	0.5 dB (Matched Pair) per octave band (except 2085-6018-00) 2085-6018-00, 0.8 dB (Matched Pair) per octave band[5]
Temperature Range	-65°C to +100°C
Finish	Passivated Stainless Steel

Mechanical Outline



Frequency Range (GHz)	Flatness[1] Typical (± dB)	VSWR[1] Typical	Open Circuit Voltage Sensitivity[2] (mV/mW) Typ.	Min.	Tangential Sensitivity[3] (-dBm) Typ.	Min.	Output Capacitance Typical (pF)	Dimension A Inches	(mm)	Replacement Diode Part Number	Detector Part Number
1.0-18.0	1.5	4.0	500	400	47.0	46.0	12	1.35	(34.3)	9999-4018-00	2085-6010-00
1.0-2.0	0.2	2.5	780	700	53.0	52.0	18	1.35	(34.3)	9999-4018-00	2085-6013-00
2.0-4.0	0.3	1.8	840	750	53.5	52.5	18	1.55	(39.4)	9999-4028-00	2085-6014-00
4.0-8.0	0.4	2.5	610	525	52.0	51.0	12	1.55	(39.4)	9999-4029-00	2085-6015-00
8.0-12.4	0.5	2.0	640	550	52.5	51.5	12	1.55	(39.4)	9999-4030-00	2085-6016-00
12.4-18.0	0.5	2.5	600	500	52.0	51.0	9	1.55	(39.4)	9999-4031-00	2085-6017-00
18.0-26.0	0.8	4.0	600	350	52.0	49.5	6	1.35	(34.3)	9999-4032-00	2085-6018-00

Typical Extended Band Performance

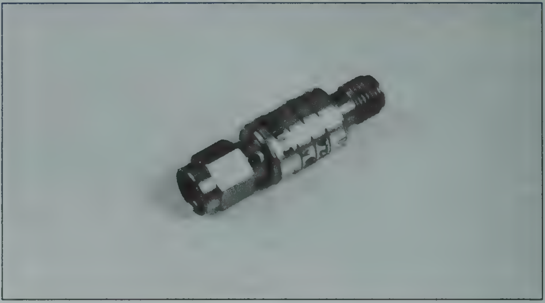
Frequency Range (GHz)	Flatness[1] Typical (± dB)	VSWR[1] Typical	Open Circuit Voltage Sensitivity[2] Typical (mV/mW)	Tangential Sensitivity[3] (-dBm)	Output Capacitance Typical (pF)	Detector Part Number
.85-6.0	1.0	3:1	500	50.0	18	2085-6013-00
1.4-5.0	1.0	3:1	500	50.0	18	2085-6014-00
3.9-9.5	1.0	3:1	500	50.0	12	2085-6015-00
6.5-14.0	1.0	3:1	400	49.0	12	2085-6016-00
2.7-18.5	1.0	3:1	400	49.0	9	2085-6017-00
4.0-26.5	1.5	5:1	300	48.0	6	2085-6018-00

Notes:

1. For RF power levels below -20 dBm and with 1,000 ohm load.
2. For RF power levels below -20 dBm.
3. With video amplifier of 1 MHz bandwidth, and 2 dB noise figure.
4. For positive output, change last two digits in part number to -13. On part number 2085-6018 severe degradation results with positive output.
5. For negative output matched pairs, change last two digits in part number to -28. For positive output matched pairs, change last two digits in part number to -29.

Biased Schottky Detectors With Replaceable Diodes

2086-Series



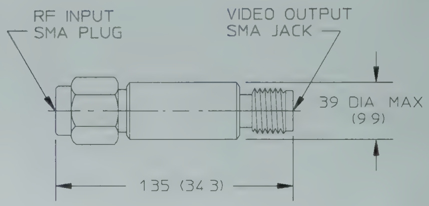
Features

- High Output Sensitivity[2]
- Flat Frequency Response to 18 GHz
- Burnout Rating 200 mW
- Available in Matched Pairs[4]
- Field Replaceable Diodes

Specifications

Video Resistance	700 Ohms Typical[1]
Output Polarity	Negative[3]
Bias Current	50 µA Nominal
Temperature Range	-65°C to +125°C
Temperature Stability	±2.0 dB
Maximum Power	200 mW CW
Finish	Passivated Stainless Steel

Mechanical Outline



Tracking/Octave[4]

Frequency Band (GHz)	Tracking (dB)
1.0-2.0	0.5
2.0-4.0	0.5
4.0-8.0	0.75
8.0-12.4	1.0
12.4-18.0	2.0

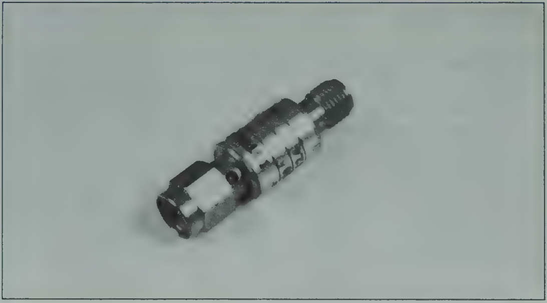
Frequency Range (GHz)	Flatness[1] Max. (± dB)	Open Circuit Voltage Sensitivity[1] (mV/mW) Min.	Tangential Sensitivity[2] (-dBm) Min.	Output Capacitance Typical (pF)	Replacement Diode Part Number	Detector Part Number
1.0-18.0	1.25	1500	52.0	12	9999-4050-00	2086-6010-00

Notes:

1. For RF power levels below -20 dBm, and with an open circuit load.
2. With video amplifier of 1 MHz bandwidth and 2 dB noise figure.
3. For positive output, order part number 2086-6010-13.
4. For negative output matched pairs, order part number 2086-6010-28.
   For positive output matched pairs, order part number 2086-6010-29.

Zero Biased Schottky Detectors With Replaceable Diodes

2086-Series



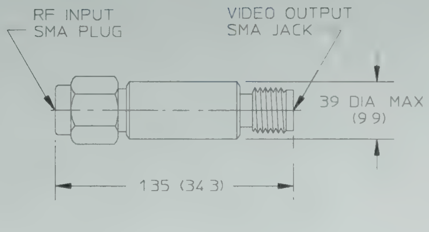
Features

- High Output Sensitivity
- Flat Frequency Response to 15 GHz
- Burnout Rating 100 mW
- No Bias Required
- Available in Matched Pairs[4]
- Field Replaceable Diodes

Specifications

Video Resistance	1200 Ohms Typical[1]
Output Polarity	Negative[3]
Temperature Range	-50°C to +125°C
Maximum Power	100 mW CW
Finish	Passivated Stainless Steel

Mechanical Outline



Tracking/Octave[4]

Frequency Band (GHz)	Tracking (dB)
1.0-2.0	0.5
2.0-4.0	0.5
4.0-8.0	0.75
8.0-12.4	1.0
12.4-15.0	2.0

Frequency Range (GHz)	Flatness[1] Max. (± dB)	Open Circuit Voltage Sensitivity[1] (mV/mW) Min.	Tangential Sensitivity[2] (-dBm) Min.	Output Capacitance Typical (pF)	Replacement Diode Part Number	Detector Part Number
1.0-15.0	1.25	1500	52.0	12	9999-4033-00	2086-6000-00

Notes:

1. For RF power levels below -20 dBm, and with an open circuit load.
2. With video amplifier of 1 MHz bandwidth and 2 dB noise figure.
3. For positive output, order part number 2086-6000-13.
4. For negative output matched pairs, order part number 2086-6000-28.
   For positive output matched pairs, order part number 2086-6000-29.

Point Contact Detectors With Replaceable Diodes

2087-Series

Features

- Broadband Frequency Ranges
- No Bias Required
- Flat Frequency Response
- Available in Matched Pairs[5]
- Field Replaceable Diodes
- Passivated Stainless Steel Finish

Specifications

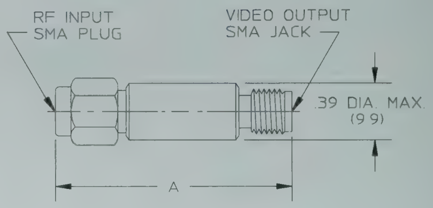
Part Number 2087-6001-00

Flatness (Maximum)	±0.5 dB, 10 MHz to 4 GHz ±1.0 dB, 10 MHz to 8 GHz ±1.5 dB, 10 MHz to 12 GHz ±2.5 dB, 10 MHz to 18 GHz
VSWR (Maximum)	1.5:1, 10 MHz to 4 GHz 2.0:1, 10 MHz to 8 GHz 3.0:1, 10 MHz to 12 GHz 3.5:1, 10 MHz to 18 GHz
Tracking	0.8 dB (Matched Pair)[6]
Maximum Power	100 mW
Output Polarity	Negative[5]
Video Resistance	6K Ohms Typical[2]
Temperature Range	-65°C to +100°C

Part Number 2087-6010-00

Tracking	0.8 dB (Matched Pair)[6]
Maximum Power	40 mW CW
Output Polarity	Negative[4]
Video Resistance	20K Ohms Typical[2]
Temperature Range	-30°C to +70°C

Mechanical Outline



Frequency Range[1] (GHz)	Open Circuit Voltage Sensitivity[2] (mV/mW) Min.	Tangential Sensitivity[3] (-dBm) Min.	Output Capacitance Typical (pF)	Dimension A Inches (mm)	Replacement Diode Part Number	Detector Part Number
.01-18.0	400	45	12	1.55 (39.4)	9999-4019-00	2087-6001-00
.01-12.4	300	43	80	1.96 (49.8)	9999-4004-00	2087-6010-00

Notes:

1. Usable to 20 GHz.
2. For RF power levels below -20 dBm, and with an open circuit load.
3. With video amplifier of 1 MHz bandwidth and 2 dB noise figure.
4. For positive output, order part number 2087-6010-13 and replacement diode part number 9999-4005-00.
5. For positive output, change the last two digits of the part number to -13.
6. For negative output matched pairs, change the last two digits of the part number to -28.
   For positive output matched pairs, change the last two digits of the part number to -29.

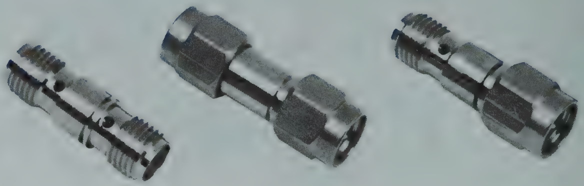
COAXIAL COMPONENTS

dc Blocks 44
Monitor Tee/dc Blocks 45
Phase Shifters 46
Line Stretchers 47

M/A-COM

Inside • Outside • Inside/Outside dc Blocks

- Small Size
- Broadband Performance 0.01 to 20 GHz
- Low Insertion Loss
- Rugged Construction
- Light Weight
- Meets MIL-E-5400 and MIL-E-16400 Environments
- Connectors: OSM/SMA per MIL-C-39012
- Power: Average 20 Watts CW
  Peak 1000 Watts



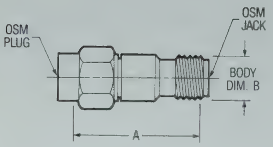


FIG. 1

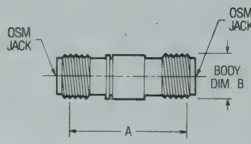


FIG. 2

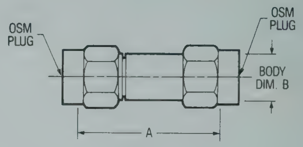


FIG. 3

NOTE: All dimensions are ± .020.

SPECIFICATIONS

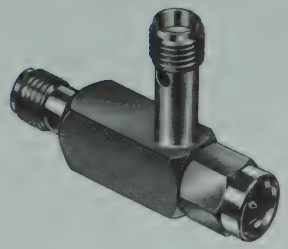
PART NO.	FIG. NO.	FREQUENCY RANGE (GHz)	VSWR (max.)	INSERTION LOSS dB (max.)	MAIN LINE MAXIMUM VOLTAGE (Vdc)	SIZE, INCHES (mm)		WEIGHT	
						A	B	oz.	g
Inside dc Block									
2046-6010-00[1]	1	.01-2.0	1.15	0.2	200	1.375 (35)	.31 SQ. (7.9)	.25	7
2046-6020-00[1]	1	0.5-18.0	1.25 (0.5-8.0) 1.35 (8.0-12.4) 1.45 (12.4-18.0)	0.4 (0.5-8.0) 0.5 (8.0-12.4) 0.6 (12.4-18.0)	600	1.10 (28)	.300 DIA. (7.6)	.21	6
2046-6030-00[2]	1	.25-18.0	1.35	0.5	300	.88 (22.4)	.25 DIA. (6.4)	.18	5.1
2046-6031-00[2]	2	.25-18.0	1.35	0.5	300	.78 (19.8)	.25 DIA. (6.4)	.16	4.5
2046-6032-00[2]	3	.25-18.0	1.35	0.5	300	.98 (24.9)	.25 DIA. (6.4)	.20	5.7
2046-6033-00[2]	3	0.2-20.0	1.3:1	0.4	100	1.38 (35.1)	.50 DIA. (12.7)	.58	16.2
Outside dc Block									
2045-6010-00[1]	1	1.0-18.0	1.35 (1.0-12.4) 1.45 (12.4-18.0)	0.5	400	1.10 (28)	.300 DIA. (7.6)	.21	6
Inside/Outside dc Block									
2044-6010-00[1]	1	1.0-18.0	1.35 (1.0-12.4) 1.45 (12.4-18.0)	0.4 (1.0-18.0) 0.6 (8.0-12.4) 0.8 (12.4-18.0)	300	1.10 (28)	.300 DIA. (7.6)	.21	6

Finish: Passivated Stainless Steel

[1] Temperature Range: −54° to +71°C
[2] Temperature Range: −54° to +125°C

Monitor Tee/dc Blocks

- Broadband Performance: .75 - 18.0 GHz
- Power: Average 20 Watts CW
  Peak 1000 Watts
- Temperature Range: -54°C to +71°C
- Connectors: OSM® (SMA) per MIL-C-39012 or 3.5 mm



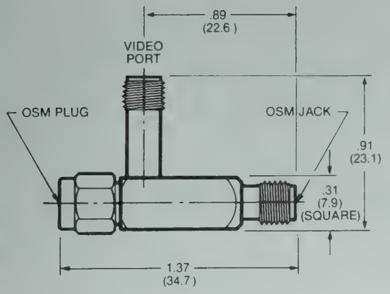


FIG. 1

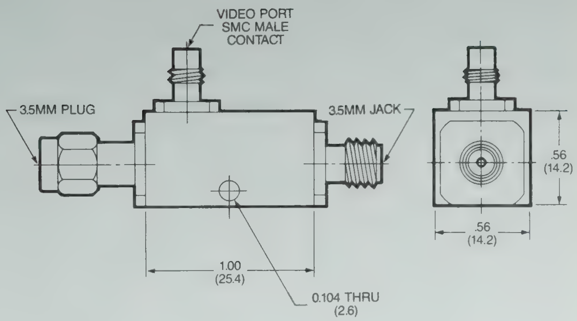


FIG. 2

NOTE: All dimensions are ± .020.

Specifications

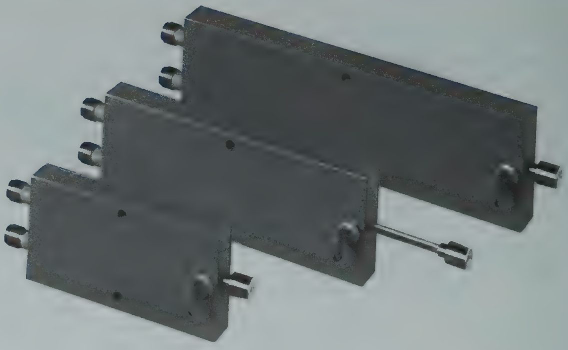
Part Number	Figure Number	Frequency Range (GHz)	VSWR Max	Insertion Loss Max. (dB)	Main Line Maximum Voltage (Vdc)	Maximum Current (Adc)	Weight oz.	Weight g
2047-6010-00	1	0.75 - 2.0	1.30	0.3	600	.25	0.5	14.2
2047-6011-00	1	1.5 - 4.0	1.35	0.4	600	.25	0.5	14.2
2047-6013-00	1	4.0 - 11.0	1.45	0.7	600	.25	0.5	14.2
2047-6015-00	1	11.0 - 18.0	1.50	0.7	600	.25	0.5	14.2
2047-6016-00	2	2.0 - 18.0	1.35	1.0	250	.50	.62	17.6

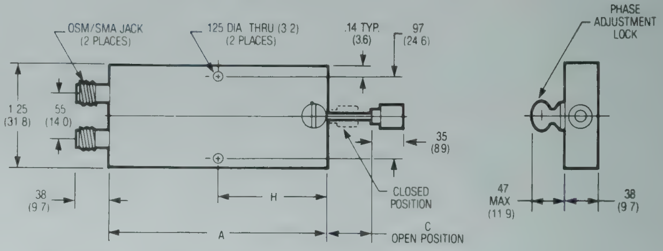
Finish: Gold plate for Figure 1.
Epoxy paint for Figure 2.

Phase Shifters

- **Fixed Connector Positions**
- **Low Loss**
- **Broadband**
- **Choice of Minimum Phase Shift**
- **Temperature Range: −65° to +125°C**
- **Power: Average 50 Watts**
  Peak 1000 Watts

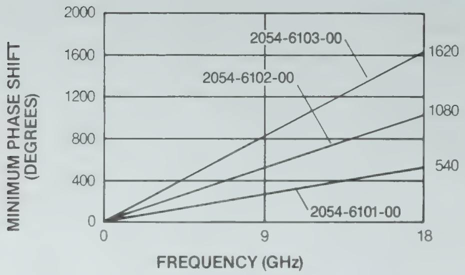
This is a new series of broadband coaxial mechanical phase shifters. These trombone style line stretchers have fixed input/output connectors so they can be used to equalize or change phase slopes in a chain of hard mounted components, without the addition of cable service loops. Airline design and precision tolerancing of internal slide connections allow for a low loss device that can be manually set to precise phase lengths and, once locked in place, remains stable in the roughest shock, vibration and thermal environments (meets MIL-E-5400 and MIL-E-16400 environments). Three different phase slope units are offered so that insertion loss is minimized. Other connectors, phase slopes and configurations are available upon request.

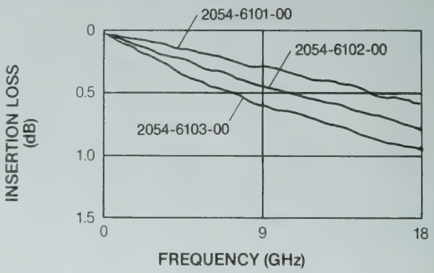




Finish: Medium gray paint. Passivated stainless steel connectors.
NOTE: All dimensions are ± .020, except mounting hole diameters (± .005) and mounting hole locations (± .010).

TYPICAL PERFORMANCE





Specifications

Part Number	Phase Shift Min.	Insertion Loss (dB)	VSWR	Size, Inch (mm) A	 C	 H	Weight oz.	 g
2054-6101-00	30°/GHz	0.3 + .025f(GHz)	1.3, dc - 10 GHz 1.5, 10 - 18 GHz	2.50 (63.5)	.50 Nom. (12.7)	1.25 (31.8)	2.5	71.4
2054-6102-00	60°/GHz	0.3 + .035f(GHz)	1.4, dc - 10 GHz 1.6, 10 - 18 GHz	3.50 (88.9)	1.00 Nom. (25.4)	1.75 (44.5)	3.5	100.0
2054-6103-00	90°/GHz	0.3 + .045f(GHz)	1.5, dc - 10 GHz 1.7, 10 - 18 GHz	4.50 (114.3)	1.50 Nom. (38.1)	2.25 (57.2)	4.5	128.6
2054-6104-00	180°/GHz	0.3 + .075f(GHz)	1.8, dc - 10 GHz 2.0, 10 - 18 GHz	7.50 (190.5)	3.00 Nom. (76.2)	3.75 (95.3)	7.5	212.8

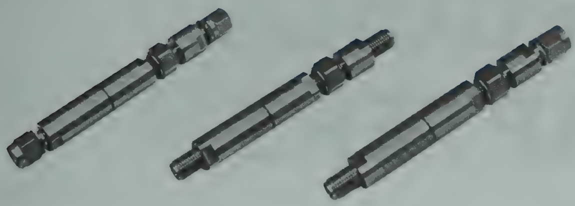


FIG. 1

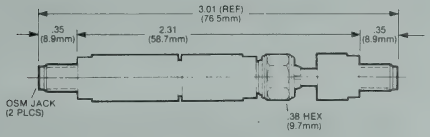


FIG. 2

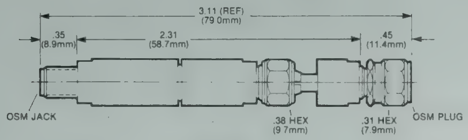
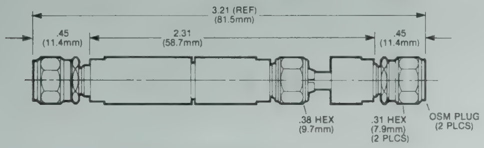


FIG. 3

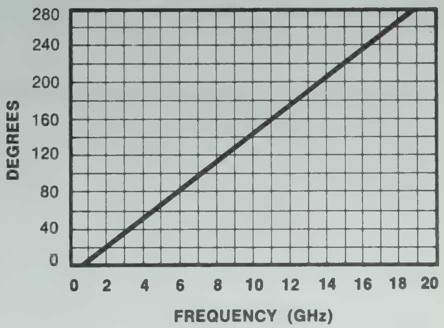


NOTE: All dimensions are ± .020.

- **Constant Impedance**
- **Quick Adjusting**
- **Secure Locking**
- **Captured Contacts**
- **Temperature Range: −65° to +125°C**
- **Meets MIL-E-5400 and MIL-E-16400 Envrionments**

Line Stretchers are used to adjust the electrical separation of other components. The length of travel is .500 inch (12.7 mm), both mechanically and electrically. They are bi-directional. The design is such that at all times the impedance is 50 ohms. A locking device is provided to adjust sliding tension and to lock the desired adjustments.

MAXIMUM △ PHASE SHIFT vs FREQUENCY



SPECIFICATIONS

PART NO.	FREQUENCY RANGE (GHz)	VSWR (max.)	INSERTION LOSS (dB)	TIME DELAY (nanoseconds) (min.) (max.)	POWER AVG. (W)	POWER PK. (kW)	FIG.
2054-6001-00	dc-18.0	1.30 (dc-10.0) 1.40 (10.0-18.0)	.20 + .03f	.30 - .38	20	1.0	1
2054-6002-00	dc-18.0	1.30 (dc-10.0) 1.40 (10.0-18.0)	.20 + .03f	.31 - .39	20	1.0	2
2054-6003-00	dc-18.0	1.30 (dc-10.0) 1.40 (10.0-18.0)	.20 + .03f	.31 - .39	20	1.0	3

MECHANICAL SPECIFICATIONS

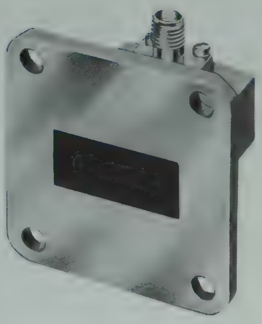
FIG.	CONNECTORS	LENGTH (L) EXTENDED (max.) in.	LENGTH (L) EXTENDED (max.) mm	DIAMETER (max.) in.	DIAMETER (max.) mm	WEIGHT oz.	WEIGHT g
1	OSM Jacks	3.5	88.9	.385	9.78	1.30	36.5
2	OSM Plug OSM Jack	3.6	91.5	.385	9.78	1.35	38.0
3	OSM Plug OSM Plug	3.7	94.0	.385	9.78	1.40	39.5

Finish: Passivated Stainless Steel

WAVEGUIDE ADAPTERS

Rectangular Waveguide to OSM® (SMA) Adapters 49
Rectangular Waveguide to Type N Adapters 49

Waveguide to OSM® (SMA) Adapters

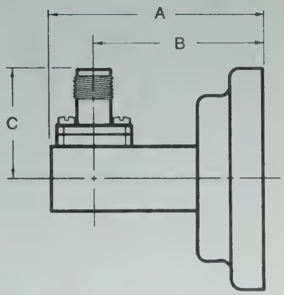


Features

- Frequency Range: 8.2 - 26.5 GHz
- Connector: OSM® (SMA) Miniature Jack[1]
- VSWR 1.1 Typical, 1.25 Max.
- Applicable MIL-Specifications:
  Adapter: MIL-A-22641, Class 5
  Connector: MIL-C-39012/57

Specifications

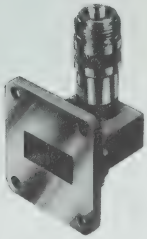
Part Number[2]	Frequency Range (GHz)	Fits WG Size	W/G Flange Type	Max. Size, Inches (mm) Dim. A	Dim. B	Dim. C
2000-6254-00	8.2 - 12.4	WR-90	UG-135/U	1.29 (32.7)	0.92 (23.3)	.72 (18.2)
2000-6257-00	10.0 - 15.0	WR-75	No UG Desig.	1.26 (32.0)	0.90 (22.8)	.70 (17.7)
2000-6255-00	12.4 - 18.0	WR-62	UG-1665/U	1.26 (32.0)	0.96 (24.3)	.66 (16.7)
2000-6256-00[3]	18.0 - 26.5	WR-42	UG-597/U	1.01 (25.6)	.73 (18.5)	.59 (14.9)



---

1. Also available with OSM® (SMA) plug. Change 4th digit in part number to 1, i.e. 2001-6254-00 (C dimension will vary).
2. Also available with choke flange. Change 7th digit to 6, i.e. 2000-6265-00.
3. VSWR 1.35, 25 to 26.5 GHz.

Waveguide to Type N Adapters

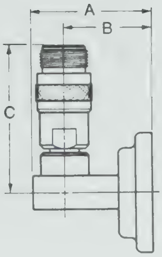


Features

- Frequency Range: 8.2 - 18.0 GHz
- Connector: Type N Jack[2]
- VSWR 1.1 Typical, 1.25 Max.
- Applicable MIL-Specifications:
  Adapters: MIL-A-22641, Class 1
  Connector: MIL-C-39012/1

Specifications

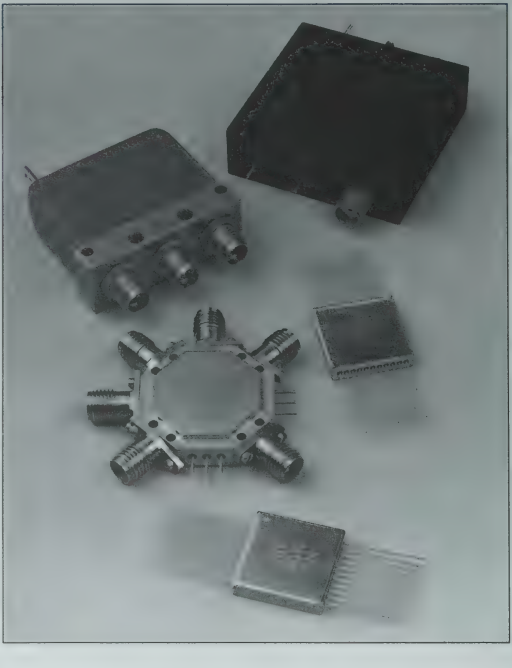
Part Number[1]	Frequency Range (GHz)	Fits WG Size	W/G Flange Type	Max. Size, Inches (mm) Dim. A	Dim. B	Dim. C
3000-6254-00	8.2 - 12.4	WR-90	UG-135/U	1.29 (32.7)	0.91 (23.1)	1.68 (42.7)
3000-6255-00	12.4 - 18.0	WR-62	UG-1665/U	1.26 (32.0)	0.96 (24.3)	1.63 (41.4)



---

1. Also available with choke flange. Change 7th digit to 6, i.e. 3000-6264-00.
2. Also available with Type N plug. Change 4th digit in part number to 1, i.e. 3001-6254-00 (C dimension will vary).

SWITCHES AND SWITCH DRIVERS



SPST Reflective Switches 51
SPDT Reflective Switches 52
SP5T Reflective Switches 53
Miniature SPDT Electromechanical Switches 54
Switch Drivers 56

2660-Series

Features

- Broadband Frequency Ranges
- Environmentally Sealed
- TTL Compatible
- Small Size

Description

M/A-COM's diode switches cover instantaneous multi-octave bandwidths from UHF to Ku-band. M/A-COM's capability in both semiconductor and digital circuit technology allows considerable flexibility in the tradeoffs of power, speed, RF parameters and drivers.

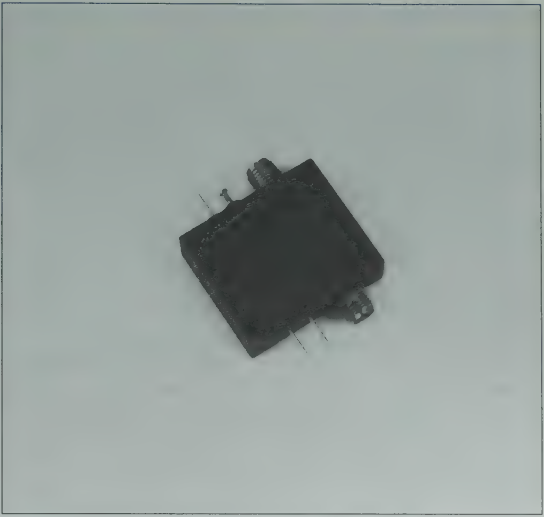
Environmental

These devices are designed to meet the following conditions:

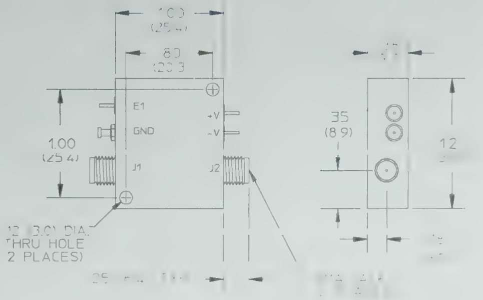
Test	MIL-STD	Method	Cond
Temperature Cycle	883	1010	C
Constant Acceleration	883	2001	A
Vibration	202	214	
Solvent Resistance	883	2015	
Salt Spray	202	101	A
Moisture Resistance	202	106	

Maximum Ratings

Storage Temp.	-65°C to +125°C
Operating Temp.	-55°C to +95°C



Mechanical Outline



Specifications 25°C

Frequency Range (GHz)	Insertion Loss (dB)	VSWR	Isolation (dB)	Transition Time (nS)	Switching Speed(nS)	Operating Power (W)	Part Number[5]
2-18	2.2	2.00:1	55	5	30	0.1	2660-1015-00

Notes:

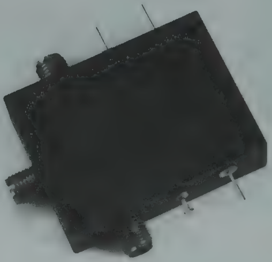
1. Driver current req. ±60mA typ.
2. Logic "0" for low loss.
3. Transition Time measured from 10% to 90% of detected RF.
4. Switch Speed measured from 50% TTL to 10%/90% detected RF.
5. Bias Voltage = +5/-12V
   Logic Connector = Solder Pin

SPDT Reflective Switches With Drivers

2664-Series

Features

- Broadband Frequency Ranges
- Environmentally Sealed
- TTL Compatible
- Small Size



Description

M/A-COM's diode switches cover instantaneous multi-octave bandwidths from UHF to Ku-band. M/A-COM's capability in both semiconductor and digital circuit technology allows considerable flexibility in the tradeoffs of power, speed, RF parameters and drivers.

Environmental

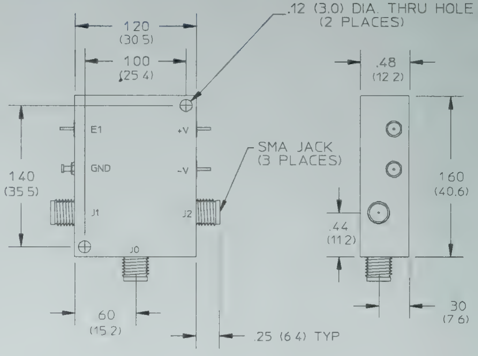
These devices are designed to meet the following conditions:

Test	MIL-STD	Method	Cond
Temperature Cycle	883	1010	C
Constant Acceleration	883	2001	A
Vibration	202	214	
Solvent Resistance	883	2015	
Salt Spray	202	101	A
Moisture Resistance	202	106	

Maximum Ratings

Storage Temp.	-65°C to +125°C
Operating Temp.	-55°C to +95°C

Mechanical Outline



Specifications 25°C

Frequency Range (GHz)	Insertion Loss (dB)	VSWR	Isolation (dB)	Transition Time (nS)	Switching Speed(nS)	Operating Power (W)	Part Number[7]
2-18	2.8	2.00:1	55	15	30	0.1	2684-1015-00

Notes:

1. Driver current req. ±90mA typ.
2. Logic "0" for low loss J_0 - J_1.
3. Transition Time measured from 10% to 90% of detected RF.
4. Switch Speed measured from 50% TTL to 10%/90% detected RF.
5. Single input control.
6. Separate input control available as special.
7. Bias Voltage = +5/-12V
   Logic Connector = Solder Pin

SP5T Reflective Switches With Drivers and Removable Connectors

2684-Series

Features

- Broadband Frequency Range: 2-18 GHz
- Hermetically Sealed
- Connectorized or Drop-In Module Capability
- Low Insertion Loss to 3.3 dB Max.
- High Isolation to 70 dB Min.
- Fast Switching Time 25nS

Description

M/A-COM's diode switches cover multi-octave bandwidths from UHF to Ku-band. Small package size conserves system space and minimizes transmission line losses. These switches may be used as drop-ins in stripline assemblies simply by removing the SMA connectors. In addition, the field replaceable connectors allow replacement of a damaged connector without violating the hermetic seal.

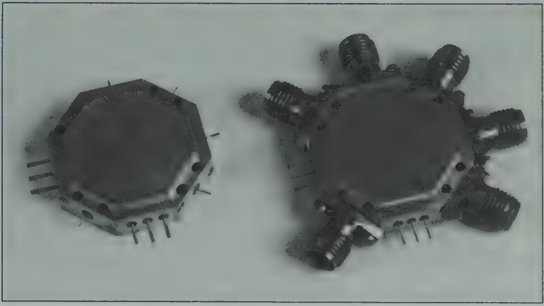
Environmental

These devices are designed to meet the following screening conditions:

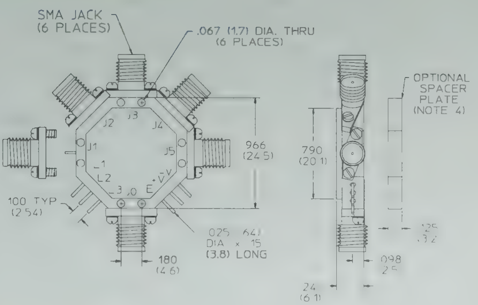
Test	MIL-STD	Method	Cond
Non-Destructive Bond Pull	883	2023	
Internal Visual	883	2017	
Stabilization Bake	883	1008	B
Thermal Cycle	883	1010	B
Constant Acceleration	883	2001	A (Y1 Axis)
Burn-in	883	1015	125°C
Seal Fine Gross	883 883	1014 1014	A1 C1
External Visual	883	2009	

Maximum Ratings

Storage Temp.	-65°C to +125°C
Operating Temp.	-55°C to +95°C



Mechanical Outline



Logic Table

TTL Control Input				J0-J1	J0-J2	J0-J3	J0-J4	J0-J5
L1	L2	L3	E					
1	0	0	1	Insertion Loss	Isolation	Isolation	Isolation	Isolation
0	1	0	1	Isolation	Insertion Loss	Isolation	Isolation	Isolation
1	1	0	1	Isolation	Isolation	Insertion Loss	Isolation	Isolation
0	0	1	1	Isolation	Isolation	Isolation	Insertion Loss	Isolation
1	0	1	1	Isolation	Isolation	Isolation	Isolation	Insertion Loss
X	X	X	0	Isolation	Isolation	Isolation	Isolation	Isolation

TTL Logic: "0" =0 to 0.8V @ -1.6 mA Max. Sink.
"1" =2.0 to 5.0V @ 40μA Max. Source.
"X"= "0" or "1"

Specifications 25°C

Frequency Range (GHz)	Insertion Loss (dB)	VSWR	Isolation (dB)	Transition Time (nS)	Switching Speed(nS)	Operating Power (W)	Part Number[4]
2-18	3.3	2.00:1	65	10	25	0.1	2684-1004-00

Notes:

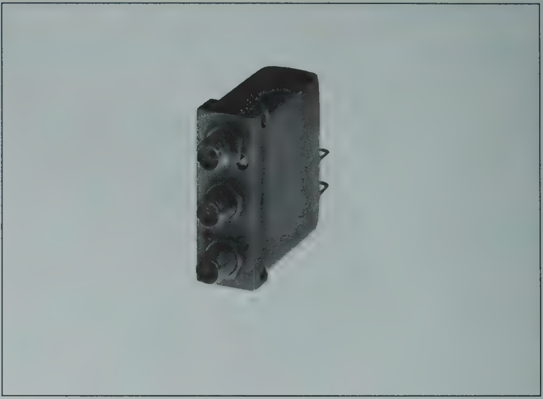
1. Driver current req. +5.0 ±.25V @ +175mA typ.
-12.0 ±.75 @ -90mA typ.

Alternate bias options are available.

2. Transition Time measured from 10% to 90% of detected RF.
3. Switch Speed measured from 50% TTL to 10%/90% detected RF.
4. To designate optional spacer plate, change 5th digit of part number to "2", i.e. 2684-2001-XY.
Bias Voltage = +5V/-12V
Logic Connector = Solder Pin

Miniature SPDT Electromechanical Switches

7530-Series



Features

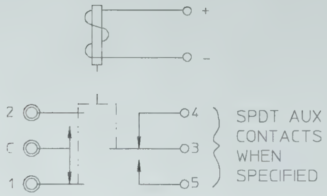
- dc - 26.5 GHz Frequency Coverage
- Switching Time: 15 mS Typical
- Life Cycles: > 1,000,000
- Meets requirements of MIL-S-3928
- Switching Action: Break-Before-Make
- Lightweight Construction
- Construction: Aluminum Body and Housing
- Finish: Per MIL-C-5541 (Body), MIL-A-8625 (Cover)
- Failsafe and Latching Operating Modes

Description

M/A-COM Control Components Division introduces a new line of miniature SPDT Electromechanical Switches. Reduction of contact wear and fewer component parts result in increased life cycles and exceptional reliability. Accurately positioned rigid contacts provide excellent repeatability and a uniform impedance match over the dc to 26.5 GHz frequency range. This series is supplied in a variety of configurations with special options available upon request.

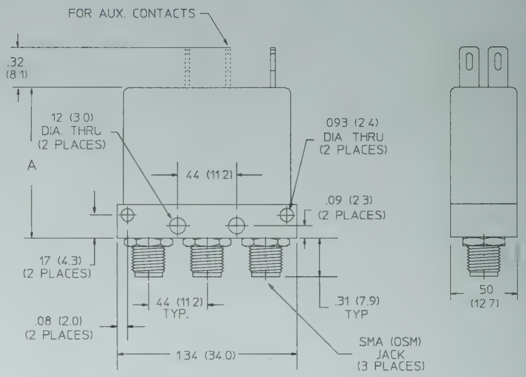
Environmental Characteristics

Operating Temperature	-55˚C to +85˚C
Vibration	Sine 10g's Peak, 55 to 2,000 Hz
Shock	50g's, 11 mS Duration
Relative Humidity	95%



FAILSAFE SCHEMATIC
DEENERGIZED

Mechanical Outline



Switch Type	Dim. A Inches (mm)
Failsafe	1.12 (28.4)
Latching	1.70 (43.2) Max.

Drive Characteristics

Operating Mode	Frequency Range (GHz)	Operating Voltage (Vdc)	Coil Resistance[1] (Ohms)	Nominal Operating Current (mA) @ Vdc		Control Logic	Position Indicating Controls	Part Number
Failsafe	dc - 18.0	20-30	270	104	28	None	None	7530-6412-00
	dc - 26.5	20-30	270	104	28	None	None	7530-6422-00
Latching	dc - 18.0	20-30	270	104	28	None	None	7530-6414-00
	dc - 26.5	22-30	350	80	28	None	None	7530-6424-00

Notes:

1. ±10% @ 20°C.

RF Characteristics

Frequency Range	Insertion Loss (dB) Max.	VSWR Max.	Isolation (dB)	CW Power (W) Max.
dc-4.0	0.15	1.10:1	90*	60
4.0-8.0	0.25	1.15:1	85*	50
8.0-12.4	0.35	1.20:1	80	35
12.4-18.0	0.50	1.40:1	70	25
18.0-26.5	0.60	1.50:1	50	20

*80 dB isolation for dc - 18 GHz versions: 7530-6412-00 and 7530-6414-00.

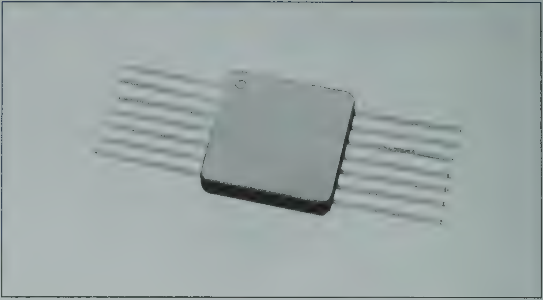
Options

- TTL Drive
- Special Finish or Marking
- Special Coil Voltages
- Arc Suppression Diodes
- Differential Drive Input (RS 422)
- Environmental & Hermetic Sealing
- Manual Operation
- Multi-Pin Power Connectors
- Solder Terminals/Locations
- Mounting Configurations
- Pulse Latching Activation (Not Disconnect)
- Special High Reliability (Temp., Alt., Pres., Life)

SPST PIN Diode Switch Driver

Features

- Reverse Voltage Protection
- 30 MHz Repetition
- TTL Control Port Protection
- Test Port Short Circuit Protection

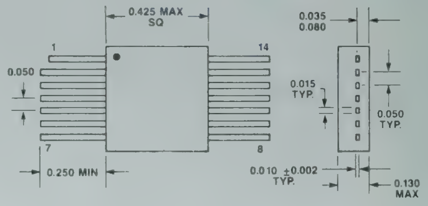


Operating Characteristics

Switching Characteristics*	
T_{on}	8 nS Max.
T_{off}	7 nS Max.
Mode Control	
Logic "1"	Driver Non-Inverting
Logic "0"	Driver Inverting
TTL Control Ports	1 Unit Load Max.
Operating Voltages	+5 Vdc ±5% -5 to -15 Vdc
Package Type	Hermetic 14 pin Kovar
Environmental	Screening available for MIL-STD-883, Method 5008, Table VIII.

*Measured at 1 MHz repetitive rate into opposite polarity IN4148 diodes. A bypass capacitor (.01 µF) is required at each voltage supply.

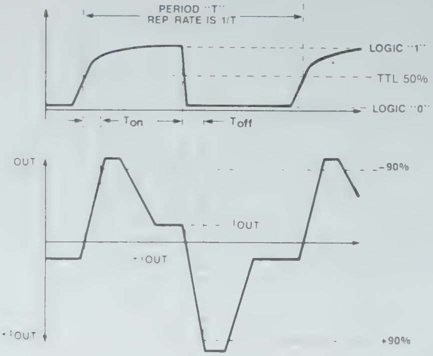
Mechanical Outline



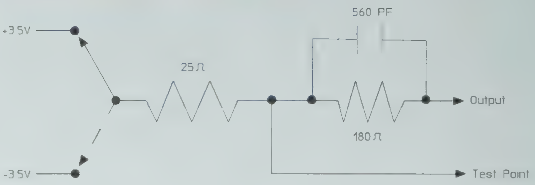
Pin Functions:

1. -5V to -15V	6. Mode Control
2. Output	7. +5V
3. Ground	8.-10. N.C.
4. N.C.	11. Test Point
5. TTL	12.-14. N.C.

Output Waveform



Equivalent Output Circuit



Typical Specifications 25°C**

Output Current (Min.)	Peak Output Current (Min.)	Open Circuit Output Voltage (Min.)	Internal Current Drain (Max.) No Load	Repetition Rate (Max.)	Part Number
±10 mA	±200 mA	± 3.5 Vdc	+18 mA -6 mA	30 MHz	4010-15M

**Measured at a 1 MHz repetition rate into a 10 ohm resistive load.

SPDT Pin Diode Switch Driver

Features

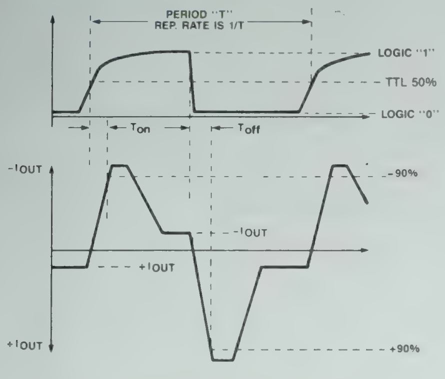
- Reverse Voltage Protection
- 30 MHz Repetition
- TTL Control Port Protection
- Test Port Short Circuit Protection

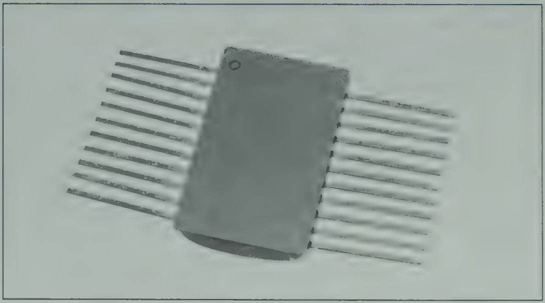
Operating Characteristics

Switching Characteristics*	
T on	8 nS Max.
T off	7 nS Max.
Mode Control	
Logic "1"	Driver Non-Inverting
Logic "0"	Driver Inverting
TTL Control Ports	1 Unit Load Max.
Operating Voltages	+5 Vdc ±5% -5 to -15 Vdc
Package Type	Hermetic 22 pin Kovar
Environmental	Screening available for MIL-STD-883, Method 5008, Table VIII.

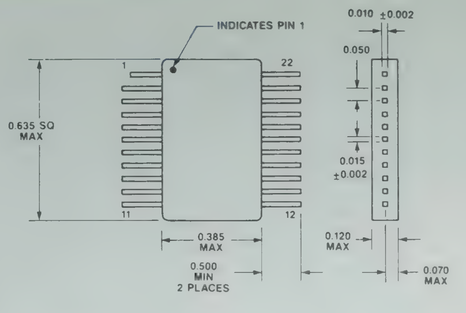
*Measured at 1 MHz repetitive rate into opposite polarity IN4148 diodes. A bypass capacitor (.01 µF) is required at each voltage supply.

Output Waveform





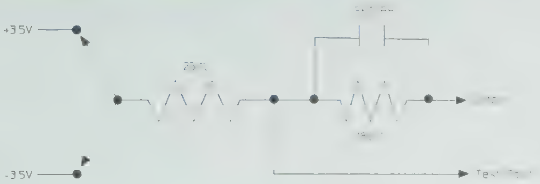
Mechanical Outline



Pin Functions:

1. Test Point 1
2. Output 1
3. N.C.
4. Input 1
5. Ground
6. Mode Control 1
7. Mode Control 2
8. Input 2
9. N.C.
10. Output 2
11. Test Point 2
12. +5V
13.-21. N.C.
22. -5V to -15V

Equivalent Output Circuit



Typical Specifications 25°C**

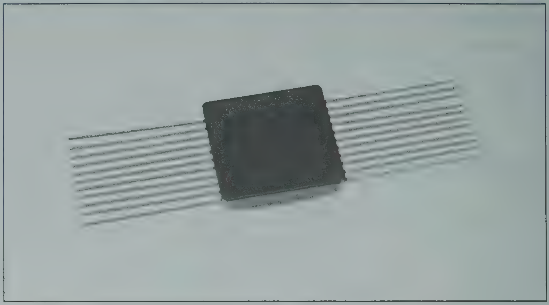
Output Current (Min.)	Peak Output Current (Min.)	Open Circuit Output Voltage (Min.)	Internal Current Drain (Max.) No Load	Repetition Rate (Max.)	Part Number
±10 mA	±200 mA	± 3.5 Vdc	+18 mA -8 mA	30 MHz	4020-11M

**Measured at a 1 MHz repetition rate into a 10 ohm resistive load.

SP4T PIN Diode Switch Driver

Features

- Reverse Voltage Protection
- 30 MHz Repetition
- TTL Control Port Protection
- Test Port Short Circuit Protection

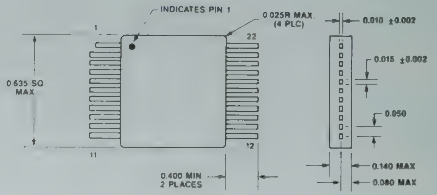


Operating Characteristics

Switching Characteristics*	
T_{on}	8 nS Max.
T_{off}	7 nS Max.
Mode Control	
Logic "1"	Driver Non-Inverting
Logic "0"	Driver Inverting
TTL Control Ports	1 Unit Load Max.
Operating Voltages	+5 Vdc ±5% -5 to -15 Vdc
Package Type	Hermetic 22 pin Kovar
Environmental	Screening available for MIL-STD-883, Method 5008, Table VIII.

*Measured at 1 MHz repetitive rate into opposite polarity IN4148 diodes. A bypass capacitor (.01 µF) is required at each voltage supply.

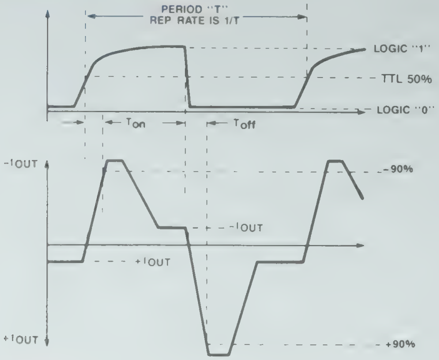
Mechanical Outline



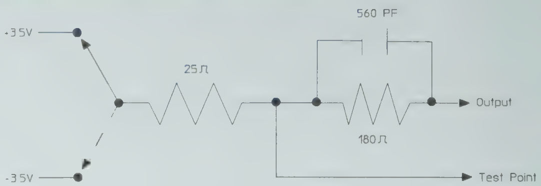
Pin Functions:

1. GND
2. Input 1
3. Mode 1
4. Input 2
5. Mode 2
6. Input 3
7. Mode 3
8. Input 4
9. Mode 4
10. +5V
11. GND
12. -5V to -15V
13. N.C.
14. Output 4
15. T.P. 4
16. Output 3
17. T.P. 3
18. N.C.
19. Output 2
20. T.P. 2
21. Output 1
22. T.P. 1

Output Waveform



Equivalent Output Circuit

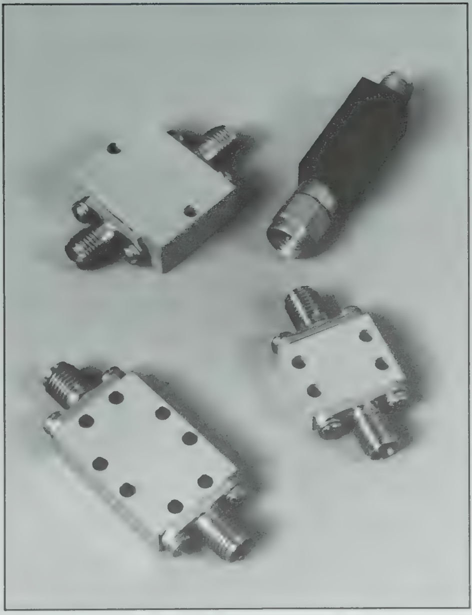


Typical Specifications 25°C**

Output Current (Min.)	Peak Output Current (Min.)	Open Circuit Output Voltage (Min.)	Internal Current Drain (Max.) No Load	Repetition Rate (Max.)	Part Number
±10 mA	±200 mA	± 3.5 Vdc	+40 mA -15 mA	30 MHz	4040-11M

**Measured at a 1 MHz repetition rate into a 10 ohm resistive load.

LIMITERS



Low Frequency Coaxial Limiters 60
Coaxial Limiters With Removable Connectors 61
40 Watt CW High Power Limiters 62

Low Frequency Coaxial Limiters

2691-Series

Features

- .001 to 2.0 GHz Frequency Coverage
- Low Insertion Loss
- 5 Watts CW
- Removable SMA Connectors

Description

M/A-COM's low frequency limiters offer circuit protection up to 5 watts CW and, due to an innovative design, feature small overall size. Equipped with field replaceable SMA connectors, they may be utilized as a connectorized or drop-in package. These devices may be tested with connectors, eliminating costly fixturing, and then mounted in a stripline circuit.

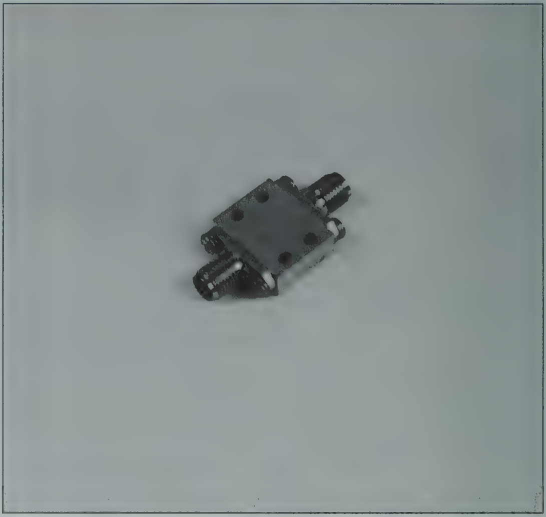
Environmental

These devices are designed to meet the following screening conditions:

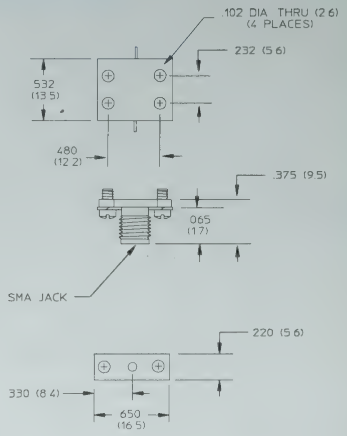
Test	MIL-STD	Method	Cond
Non-Destructive Bond Pull	883	2023	
Internal Visual	883	2017	
Stabilization Bake	883	1008	B
Thermal Cycle	883	1010	B
Constant Acceleration	883	2001	A (Y1 Axis)
Burn-in	883	1015	125°C
Seal Fine	883	1014	A1
Gross	883	1014	C1
External Visual	883	2009	

Maximum Ratings

Storage Temp.	-65°C to +125°C
Operating Temp.	-55°C to +85°C



Mechanical Outline



Specifications 25°C

Frequency Range (GHz)	Insertion Loss (dB)	VSWR	CW Power (W)	Leakage Power (mW)	Part Number
.001-2.0	0.8	1.5:1	5	100	2691-2005

Notes:
1. Insertion loss and VSWR measured at 0 dBm input power.
2. 1 dB compression: +7 dBm min.

2691-Series

Features

- Broadband Frequency Ranges
- Environmentally Sealed
- Feedback Leveling
- Small Size
- Supplied with RF Connectors (SMA female)

Description

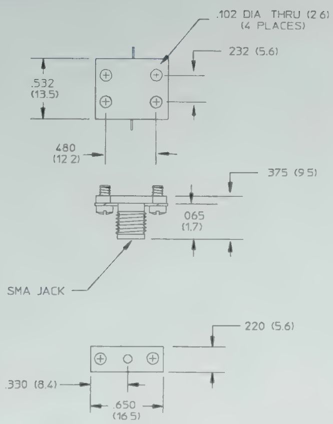
M/A-COM's 2691 series is a line of completely passive solid state receiver protectors. They exhibit octave and multi-octave performance using a unique construction technique involving PIN diodes in broadband microstrip circuits. These limiters may be used as drop-ins in stripline assemblies. In addition, the field-replaceable connectors allow replacement of a damaged connector without violating the hermetic seal. Typical insertion loss and VSWR curves are shown below.

Environmental

These devices are designed to meet the following screening conditions:

Test		MIL-STD	Method	Cond
Non-Destructive Bond Pull		883	2023	
Internal Visual		883	2017	
Stabilization Bake		883	1008	B
Thermal Cycle		883	1010	B
Constant Acceleration		883	2001	A (Y1 Axis)
Burn-in		883	1015	125°C
Seal	Fine	883	1014	A1
	Gross	883	1014	C1
External Visual		883	2009	

Mechanical Outline



Maximum Ratings

Storage Temp.	-65°C to +125°C
Operating Temp.	-55°C to +85°C

Specifications 25°C

Frequency Range (GHz)	Insertion Loss (dB)	VSWR	Average Power (W)	Peak Power (W)	Recovery Time (nS)	Leakage Power (mW)	Part Number
2.0 - 18.0	2.2	2.0:1	2.0	500	250	75	2691-1014

Notes:

1. Insertion loss and VSWR measured at 0 dBm input power.
2. Peak input power rated at 1 microsecond pulse width, 1% duty into 1.5:1 source VSWR and 1.15 load VSWR.
3. Spike leakage energy: 0.5 ergs max.
4. 1 dB compression: +7 dBm min.

40 Watt CW High Power Limiters With Removable Connectors

2698-Series

Features

- 2.0-18.0 GHz Frequency Coverage
- Low Insertion Loss
- 40 Watts Average Power
- Removable SMA Connectors

Description

M/A-COM's high power limiters will protect sensitive equipment and circuits from high CW power and long pulse width peak power. These limiters are designed to mount as either connectorized or drop-in devices. They exhibit multi-octave performance using M/A-COM's unique Schottky enhanced limiter technology.

Environmental

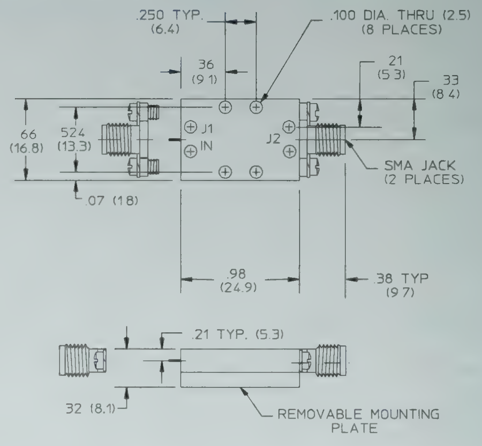
These devices are designed to meet the following screening conditions:

Test		MIL-STD	Method	Cond
Non-Destructive Bond Pull		883	2023	
Internal Visual		883	2017	
Stabilization Bake		883	1008	B
Thermal Cycle		883	1010	B
Constant Acceleration		883	2001	A (Y1 Axis)
Burn-in		883	1015	125°C
Seal	Fine	883	1014	A1
	Gross	883	1014	C1
External Visual		883	2009	

Maximum Ratings

Storage Temp.	-65°C to +125°C
Operating Temp.	-55°C to +85°C

Mechanical Outline



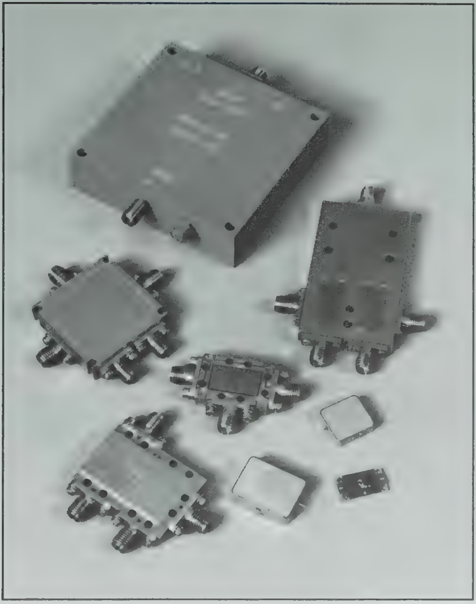
Specifications 25°C

Frequency Range (GHz)	Insertion Loss (dB)	VSWR	Average Power (W)	Peak Power (W)	Recovery Time (µS)	Leakage Power (mW)	Part Number
2.0-18.0	2.7	2.0:1	40	400	8.0	100	2698-1003

Notes:

1. Insertion loss and VSWR measured at 0 dBm input power.
2. Peak input power rated at 10 microsecond pulse width, 10% duty into 1.5:1 source VSWR and 1.15 load VSWR.
3. Spike leakage energy: 0.5 ergs max.
4. 1 dB compression: +7 dBm min.

MIXERS



Double-Balanced Mixers With Removable Connectors 64
Miniature Double-Balanced Mixer Modules 65

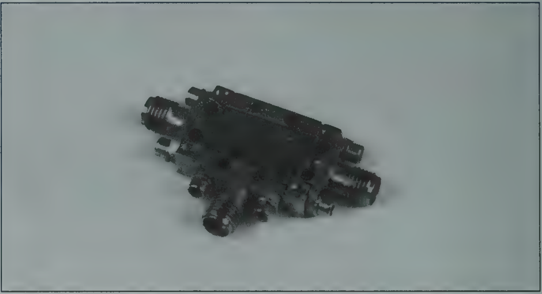
Double-Balanced Mixers With Removable Connectors

Features

- Double-Balanced 2-18 GHz
- Removable Connectors
- Ideal for Drop-in Applications
- High Reliability
- Hermetic Seal

Description

Broadband, high reliability, hermetically sealed double-balanced mixers feature SMA jack removable connectors and mounting plate for applications requiring drop-in modules. Units are also available with SMA plug connectors.

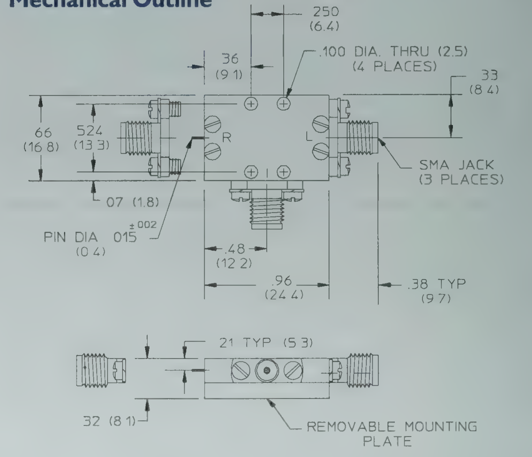


Environmental

These devices are designed to meet the following conditions:

Test	MIL-STD	Method	Cond
Mechanical Shock	202	213B	C
Constant Acceleration	883	2001	A
Thermal Cycle	883	1010	B
Vibration, HF	202	204D	D
Moisture Resistance	202	106E	-
Salt Spray	202	101D	A
Solvent Resistance	883	2015	-
Hermeticity	883	1014	Fine & Gross

Mechanical Outline



Maximum Ratings

Parameter	LO Drive Level Low Medium (L,M Suffix)	High (H Suffix)
Operating Temp. Max.	-55°C to +100°C	-55°C to +100°C
Storage Temp. Max.	-65°C to +125°C	-65°C to +125°C
RF Input Power Max.	100 mW	200 mW

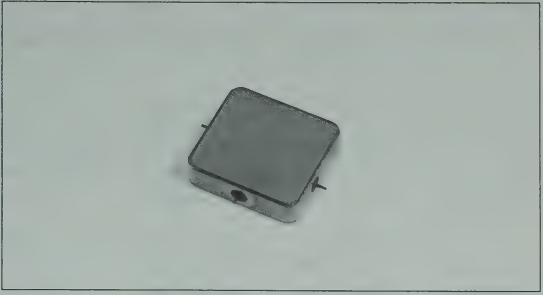
Specifications* 25°C

RF/LO Frequency Range (GHz)	L-R Isolation (dB min.)	L-I Isolation (dB min.)	3 dB IF Bandwidth (GHz min.)	LO Range (dBm) Min./Max.	Conversion Loss (dB) Max./Typ.	Input 1 dB Compression Pt. (dBm Min.)	Input 3rd Order Intercept Pt. (dBm Min.)	Part Number
2.0-18.0	20	15	.01-6.0	+7/+11	9.5/6.5	+2	+12	2902-04-DBL

Notes:
1. All measurements performed in a 50 ohm system.
2. Available in phase and amplitude matched sets; consult factory for details.

* Consult the factory for typical performance over frequency.

Miniature Double-Balanced Mixer Modules



Features

- Double-Balanced 4-18 GHz
- Ruggedized Construction Techniques
- Hermetic Seal

Description

Miniature broadband double-balanced mixers in a drop-in module configuration for direct integration into stripline or microstrip circuitry. Designed for use in high-rel military system environments.

Environmental

These devices are designed to meet the following screening conditions:

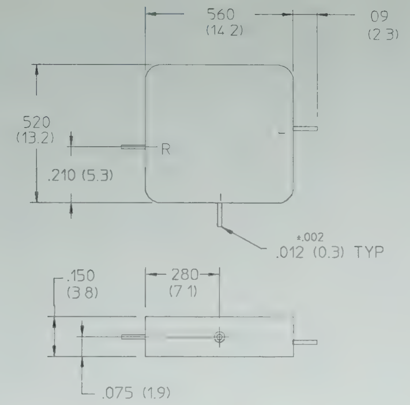
Test	MIL-STD	Method	Cond
Non-Destructive Bond Pull	883	2023	
Internal Visual	M/A-COM	QCP	H076
Stabilization Bake	883	1008	B
Thermal Cycle	883	1010	B
Constant Acceleration	883	2001	A (Y1 Axis)
Burn-in	883	1015	125°C
Seal Fine	883	1014	A1
Gross	883	1014	C1
External Visual	883	2009	

High Rel screening is available. See Appendix at the end of this section for options.

Maximum Ratings

Parameter	LO Drive Level Low Medium (L,M Suffix)	High (H Suffix)
Operating Temp. Max.	-55°C to +100°C	-55°C to +100°C
Storage Temp. Max.	-65°C to +125°C	-65°C to +125°C
RF Input Power Max.	100 mW	200 mW

Mechanical Outline



Specifications* 25°C

RF/LO Frequency Range (GHz)	L-R Isolation (dB min.)	L-I Isolation (dB min.)	3 dB IF Bandwidth (GHz min.)	LO Range (dBm) Min./Max.	Conversion Loss (dB) Max./Typ.	Input 1 dB Compression Pt. (dBm Min.)	Input 3rd Order Intercept Pt. (dBm Min.)	Part Number
4.0-18.0	18	15	dc-1.0	+7/+11	9.5/6.5	+2	+12	3601-05-DBL

Notes:

1. All measurements performed in a 50 ohm system.
2. Available in phase and amplitude matched sets. Consult factory for details.
3. Low-cost test fixture available. Consult factory for details.

* Consult the factory for typical performance over frequency.

Index of Part Numbers

Part Number	Page
1001-6113-00	16
1001-6115-00	16
1002-6113-00	16
1002-6114-00	16
1020-1310-00	23
1020-1311-00	23
1020-1312-00	21
1020-1314-00	21
1021-1310-00	22
1021-1311-00	22
1021-1312-00	20
1021-1314-00	20
2000-6254-00	49
2000-6255-00	49
2000-6256-00	49
2000-6257-00	49
2001-4173-00	24
2001-4173-02	24
2001-4178-00	24
2001-4182-02	24
2001-4294-00	24
2001-4301-00	24
2001-4302-00	24
2001-4303-00	24
2001-4304-00	24
2001-4305-00	24
2001-6005-00	16
2001-6010-00	16
2001-6100-00	14
2001-6101-00	14
2001-6105-00	14
2001-6110-00	14
2001-6111-00	14
2001-6112-00	14
2001-6113-00	14
2001-6115-00	14
2001-6117-00	14
2001-6118-00	14
2001-6143-00	14
2002-4065-00	24
2002-4065-02	24
2002-4066-00	24
2002-4066-02	24
2002-6100-00	15
2002-6101-00	15

Part Number	Page
2002-6105-00	15
2002-6110-00	15
2002-6111-00	15
2002-6112-00	15
2002-6113-00	15
2002-6114-00	15
2002-6117-00	15
2002-6118-00	15
2003-6110-00	14
2003-6111-00	14
2003-6112-00	14
2003-6113-00	14
2003-6115-00	14
2003-6117-00	14
2020-1310-00	23
2020-1311-00	23
2020-1312-00	21
2020-1314-00	21
2020-6600-06	27
2020-6601-10	27
2020-6602-20	27
2020-6603-30	27
2020-6604-06	27
2020-6605-10	27
2020-6606-20	27
2020-6607-30	27
2020-6608-06	27
2020-6609-10	27
2020-6610-20	27
2020-6611-30	27
2020-6612-06	27
2020-6613-10	27
2020-6614-20	27
2020-6615-30	27
2020-6616-06	27
2020-6617-10	27
2020-6618-20	27
2020-6619-30	27
2020-6620-06	27
2020-6621-10	27
2020-6622-20	27
2020-6623-30	27
2020-6624-06	27
2020-6625-10	27
2020-6626-20	27

Part Number	Page
2020-6627-30	27
2020-6628-06	27
2020-6629-10	27
2020-6630-20	27
2020-6631-30	27
2021-1310-00	22
2021-1311-00	22
2021-1312-00	20
2021-1314-00	20
2025-6001-06	28
2025-6002-10	28
2025-6004-20	28
2025-6010-10	28
2025-6012-20	28
2025-6013-06	28
2025-6014-10	28
2025-6016-20	28
2025-6017-06	28
2025-6018-10	28
2025-6020-20	28
2026-6004-10	29
2026-6006-20	29
2026-6007-10	29
2026-6010-10	29
2026-6013-10	29
2026-6015-20	29
2032-6371-00	26
2032-6374-00	26
2032-6375-00	26
2041-6201-00	31
2041-6202-00	31
2041-6203-00	31
2041-6204-00	31
2044-6010-00	44
2045-6010-00	44
2046-6010-00	44
2046-6020-00	44
2046-6030-00	44
2046-6031-00	44
2046-6032-00	44
2046-6033-00	44
2047-6010-00	45
2047-6011-00	45
2047-6013-00	45
2047-6015-00	45

Part Number	Page
2047-6016-00	45
2054-6001-00	47
2054-6002-00	47
2054-6003-00	47
2054-6101-00	46
2054-6102-00	46
2054-6103-00	46
2054-6104-00	46
2082-4137-03	5
2082-4137-06	5
2082-4137-10	5
2082-4137-20	5
2082-4137-30	5
2082-4381-03	7
2082-4381-06	7
2082-4381-10	7
2082-4381-20	7
2082-4381-30	7
2082-6040-03	7
2082-6041-06	7
2082-6042-10	7
2082-6043-20	7
2082-6044-30	7
2082-6141-03	7
2082-6142-06	7
2082-6143-10	7
2082-6144-20	7
2082-6144-30	7
2082-6145-03	5
2082-6146-06	5
2082-6147-10	5
2082-6148-20	5
2082-6148-30	5
2082-6190-00	12
2082-6190-03	12
2082-6190-06	12
2082-6190-10	12
2082-6190-20	12
2082-6191-03	5
2082-6192-06	5
2082-6193-10	5
2082-6194-20	5
2082-6195-30	5
2082-6340-03	8
2082-6340-06	8

Index of Part Numbers

Part Number **Page**

2082-6340-10 8
2082-6340-20 8
2082-6340-30 8
2082-6502-03 9
2082-6502-06 9

2082-6502-10 9
2082-6502-20 9
2082-6524-03 9
2082-6524-06 9
2082-6524-10 9

2082-6524-20 9
2082-6524-30 9
2085-6010-00 39
2085-6013-00 39
2085-6014-00 39

2085-6015-00 39
2085-6016-00 39
2085-6017-00 39
2085-6018-00 39
2086-6000-00 41

2086-6010-00 40
2087-6001-00 42
2087-6010-00 42
2089-6201-00 32
2089-6202-00 32

2089-6203-00 32
2089-6204-00 32
2089-6205-00 32
2089-6206-00 32
2089-6207-00 32

2089-6208-00 32
2089-6209-00 32
2089-6210-00 32
2089-6401-00 33
2089-6402-00 33

2089-6403-00 33
2089-6404-00 33
2089-6405-00 33
2089-6406-00 33
2089-6407-00 33

2089-6408-00 33
2089-6409-00 33
2089-6410-00 33
2089-6801-00 34
2089-6802-00 34

Part Number **Page**

2089-6803-00 34
2089-6804-00 34
2089-6805-00 34
2089-6806-00 34
2089-6807-00 34

2089-6808-00 34
2089-6810-00 34
2090-6201-00 36
2090-6202-00 36
2090-6203-00 36

2090-6204-00 36
2090-6205-00 36
2090-6210-00 36
2090-6214-00 35
2090-6304-00 37

2090-6309-00 37
2090-6414-00 35
2090-6814-00 35
2660-1015-00 51
2684-1004-00 53

2684-1015-00 52
2691-1014 61
2691-2005 60
2698-1003 62
2782-6051-03 6

2782-6051-06 6
2782-6051-10 6
2782-6051-20 6
2782-6251-03 6
2782-6251-06 6

2782-6251-10 6
2782-6251-20 6
2902-04-DBL 64
3000-6254-00 49
3000-6255-00 49

3001-1310-02 22
3001-1312-02 20
3001-1314-02 20
3001-1315-02 22
3001-6100-00 17

3001-6113-00 17
3001-6120-02 17
3001-6121-02 17
3001-6124-02 17
3001-6125-02 17

Part Number **Page**

3002-1310-02 23
3002-1312-02 21
3002-1314-02 21
3002-1315-02 23
3002-6100-00 17

3002-6113-00 17
3082-6141-03 10
3082-6142-06 10
3082-6143-10 10
3082-6144-20 10

3082-6190-00 12
3082-6190-03 12
3082-6190-06 12
3082-6190-10 12
3082-6190-20 12

3082-6191-03 10
3082-6192-06 10
3082-6193-10 10
3082-6194-20 10
3082-6195-30 10

3101-1310-02 22
3101-1312-02 20
3101-1314-02 20
3101-1315-02 22
3101-6100-00 18

3101-6120-02 18
3101-6121-02 18
3101-6124-02 18
3101-6125-02 18
3102-1310-02 23

3102-1312-02 21
3102-1314-02 21
3102-1315-02 23
3102-6100-00 18
3201-1310-02 22

3201-1312-02 20
3201-1314-02 20
3201-1315-02 22
3201-6100-00 18
3201-6102-02 18

3201-6103-02 18
3202-1310-02 23
3202-1312-02 21
3202-1314-02 21
3202-1315-02 23

Part Number **Page**

3202-6100-00 18
3282-6171-03 11
3282-6172-06 11
3282-6173-10 11
3282-6174-20 11

3601-05-DBL 65
4010-15M 56
4020-11M 57
4040-11M 58
4501-6110-00 19

4501-6111-00 19
4501-6112-00 19
4501-6113-00 19
4501-6115-00 19
4502-6110-00 19

4502-6111-00 19
4502-6112-00 19
4502-6113-00 19
4502-6115-00 19
4506-6110-00 19

4506-6111-00 19
4506-6112-00 19
4506-6113-00 19
4510-6110-00 19
4510-6111-00 19

4510-6112-00 19
4510-6113-00 19
4511-1314-00 20
4511-1315-00 22
4512-1314-00 21

4512-1315-00 23
4720-1314-00 21
4720-1315-00 23
4721-1314-00 20
4721-1315-00 22

5182-6001-03 10
5182-6001-06 10
5182-6001-10 10
7000-1314-02 20
7000-1315-02 22

7000-6100-00 17
7082-6190-00 12
7082-6190-03 12
7082-6190-06 12
7082-6190-10 12

Index of Part Numbers

Part Number	Page
7082-6190-20	12
7082-6190-30	12
7082-6191-03	11
7082-6192-06	11
7082-6193-10	11
7082-6194-20	11
7082-6195-30	11
7530-6412-00	55
7530-6414-00	55
7530-6422-00	55
7530-6424-00	55
9999-4004-00	42
9999-4018-00	39
9999-4019-00	42
9999-4028-00	39
9999-4029-00	39
9999-4030-00	39
9999-4031-00	39
9999-4032-00	39
9999-4033-00	41
9999-4050-00	40

DIST

For More Information

I am interested in: Part Number____________________ Quantity__________

☐ Have a Sales Engineer Call or Visit ☐ Immediate Need ☐ Future ☐ Reference

Please send information on the following:

Coaxial Connectors
(List Series Name)
- ☐ RF Series
- ☐ Microwave Series
- ☐ Millimeter Wave Series
- ☐ Adapters
- ☐ Tools & Accessories
- ☐ QPL Military Qualified

Passive Components
- ☐ Attenuators/Terminations
- ☐ Couplers/Hybrids
- ☐ Dividers/Combiners
- ☐ Electromechanical Switches
- ☐ Waveguide Adapters
- ☐ Detectors
- ☐ dc Blocks/Monitor Tees
- ☐ Stripline Assemblies

Solid State Components
- ☐ Switches and Modules
- ☐ Attenuators
- ☐ Phase Shifters
- ☐ Mixers
- ☐ Detectors
- ☐ PIN Diode Limiters
- ☐ Integrated Packages

Additional Information: ____

____

Name______________________________ Title__________________

Company ____

Address______________________________ M/S__________

City__________________ State/Country__________ Zip__________

Phone No.______________________________ Extension__________

M/A-COM • 21 Continental Blvd., Merrimack, NH 03054 • Tel. 603-424-4111 Fax. 603-424-6580

DIST

For More Information

I am interested in: Part Number____________________ Quantity__________

☐ Have a Sales Engineer Call or Visit ☐ Immediate Need ☐ Future ☐ Reference

Please send information on the following:

Coaxial Connectors
(List Series Name)
- ☐ RF Series
- ☐ Microwave Series
- ☐ Millimeter Wave Series
- ☐ Adapters
- ☐ Tools & Accessories
- ☐ QPL Military Qualified

Passive Components
- ☐ Attenuators/Terminations
- ☐ Couplers/Hybrids
- ☐ Dividers/Combiners
- ☐ Electromechanical Switches
- ☐ Waveguide Adapters
- ☐ Detectors
- ☐ dc Blocks/Monitor Tees
- ☐ Stripline Assemblies

Solid State Components
- ☐ Switches and Modules
- ☐ Attenuators
- ☐ Phase Shifters
- ☐ Mixers
- ☐ Detectors
- ☐ PIN Diode Limiters
- ☐ Integrated Packages

Additional Information: ____

____

Name______________________________ Title__________________

Company ____

Address______________________________ M/S__________

City__________________ State/Country__________ Zip__________

Phone No.______________________________ Extension__________

M/A-COM • 21 Continental Blvd., Merrimack, NH 03054 • Tel. 603-424-4111 Fax. 603-424-6580

NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 3 MERRIMACK, NH

POSTAGE WILL BE PAID BY ADDRESSEE

M/A-COM
21 Continental Boulevard
Merrimack, NH 03054-9979

NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 3 MERRIMACK, NH

POSTAGE WILL BE PAID BY ADDRESSEE

M/A-COM
21 Continental Boulevard
Merrimack, NH 03054-9979

For More Information...

In addition to the standard products represented in this catalog, M/A-COM Control Components Division covers a wide variety of devices including:

Passive Components

Fixed Coaxial Attenuators
Fixed Coaxial Terminations
Power Dividers/Combiners
Couplers/Hybrids
Electromechanical Switches
Waveguide to Coaxial Adapters
Detectors
dc Blocks/Monitor Tees
Stripline Assemblies

Solid State Components

PIN Diode Switches and Modules
PIN Diode Attenuators
Phase Shifters
Balanced Mixers
Detectors
PIN Diode Limiters
Integrated Packages

Waveguide Components

Directional Couplers
Hybrids
Bends/Twists
Terminations
Tees
Tuners
Custom Assemblies
Millimeter Products
Waveguide Windows

Ferrite Devices

Isolators
Circulators
Phase Shifters
Switches
Modulators
Attenuators
Limiters

Contact the factory directly for information on products not shown in this catalog or fill-out and return the postage paid reply card.

Other Products

RF, Microwave and Millimeter Wave Connectors Including:

OSM(SMA)
OSSM(SSMA)
TNC
N
BNC
SC

SMC Screw-on
SMB Snap-on
OSX Subminiature Snap-on
OS-2.4 (2.4mm dc - 50 GHz)
OS-2.9 (2.92mm dc - 40 GHz)

In-Series and Between-Series Adapters
Tools and Accessories
QPL Qualified Connectors and Adapters

For complete information contact M/A-COM Omni Spectra or fill-out and return the postage paid reply card.

M/A-COM Omni Spectra
140 Fourth Avenue
Waltham, MA 02254-9101
Tel: 617-890-4750
Fax: 617-890-2381

M/A-COM Control Components Division
21 Continental Boulevard
Merrimack, NH 03054-4343 U.S.A.
Telephone: 603-424-4111
FAX: 603-424-6580

Printed in U.S.A. 1991